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THE TREATMENT OF CHRONIC ARTHRITIS

GENERAL PRINCIPLES

ERNEST E. IRONS, M.D.

CHICAGO

The treatment of chronic arthritis presents a problem that requires a radical revision of current medical opinion in regard to the nature of the disease, its importance as a major cause of suffering and disability, and the necessity of a wide-angled therapeutic attack. Conceptions of many diseases formerly thought of as disturbances of one organ of the body have been broadened by increasing understanding of their morbid anatomy and physiology to include the changes that inevitably involve other systems of the body. The profession has ceased to think of nephritis as a lesion of the kidney alone, or of cardiac disease as confined in its effects to the heart. Chronic arthritis can no longer be thought of as a disease of certain joints but rather as a systemic illness, in which there may be disturbances of the circulation, the general metabolism and nutrition and the gastro-intestinal system, as well as local changes in the joints.

Very early the only objective demonstrable disturbance may be in one or more joints. The immediate cause may be infection or trauma, which, however, becomes effective in producing serious disability because of the intrinsic qualities of the tissues of the patient. Successful therapeutic measures must therefore not only be directed at one single and perhaps immediate etiologic factor but planned to meet multiple causes active in each patient. This broader view of the nature and causes of arthritis is rapidly gaining ground in this country and Canada, largely through the efforts of the American Committee for the Study and Control of Rheumatic Diseases. It is proposed to consider here some of the facts that have led to the recognition of the importance of chronic arthritis as a disease of the body as a whole, the difficulties in attaining an orderly classification based on etiology, morbid anatomy or clinical course, and the necessity of therapeutic attack based on a well rounded conception of systemic effects as well as of local alterations in the joints.

DISABILITY CAUSED BY ARTHRITIS

The suffering and disability entailed by chronic arthritis exceed that from any other of the chronic diseases of temperate climates. A recent survey of chronic disease in Massachusetts [1] showed that out of an estimated total of 500,000 persons afflicted with a chronic disease, of whom 225,000 were partially and 22,500 totally disabled, there were 138,000 persons ill with rheumatism, of whom 5,600 were totally disabled. The next most frequent cause of disability was heart disease with 84,000 and 2,600 totally disabled, followed by arteriosclerosis with 64,000, digestive diseases with 29,000, diseases of eye and ear with 24,000, apoplexy with 16,000, tuberculosis with 16,000, diabetes with 15,000 and cancer with 11,500.

The increase in average population age in Massachusetts is approximately 1 per cent with each decade. Falling birth and death rates also increase the proportions of persons who survive to the higher ages in which chronic diseases tend to increase. Similar surveys, if made in midwestern and western states, would probably yield somewhat lower figures for chronic diseases than in older populations in which larger numbers of persons have reached the higher age brackets.

Heart disease leads as a cause of death but, whereas the patient with heart disease lives from seven to nine years on the average, the rheumatic patient lives fourteen years or more. The mortality of chronic rheumatic disease is low, but the suffering and disability are enormous. Chronic arthritis offers a major challenge to the medical profession and the public.

Advances in the understanding of rheumatism are not unlike those which have evolved in other forms of disease. A century ago fevers were classified as intermittent, remittent and continued; many yielded to peruvian bark, others did not. Some were clearly identified with clinical disease entities such as yellow fever or pneumonia; others were ascribed to "phlegmasiae" or simply termed "idiopathic." With the discovery of the bacterial and protozoal causes of infections, fevers were rearranged and recognized as symptoms of underlying systemic disease, and treatment was placed on an etiologic basis.

Acute rheumatism was early separated clinically from chronic rheumatism and soon became distinguished as acute rheumatic fever; likewise gout was similarly set apart clinically. The arthropathies of neurogenic origin were recognized, and still later the identification of infections due to specific organisms such as the pneumococcus or gonococcus allowed the separation of acute and chronic arthritis associated with these infections.

There was then left the large group of cases of chronic arthritis, which Garrod in 1890 divided clinically into rheumatoid arthritis and osteo-arthritis. The view was frequently expressed then and in succeeding

Read before the Section on Practice of Medicine at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 14, 1934.

1. Bigelow, G. H., and Lombard, H. L.: Cancer and Other Chronic Diseases in Massachusetts, Boston, Houghton Mifflin Company, 1933.

decades that rheumatoid arthritis was more than a disease of joints and depended on underlying constitutional disturbances.

The application to chronic arthritis of the concept of focal infection under the leadership of Dr. Frank Billings made possible cures of metastatic joint infections, many of them so striking as to lead some observers to the conclusion that all chronic arthritis might be cured if only these patients were studied carefully enough to discover the hidden infection. Attention became centered on infection as a cause of chronic arthritis, frequently to the neglect of other or concomitant causes. General care of the patient, insisted on by Dr. Billings, was forgotten. The search for, discovery and treatment of hitherto unrecognized localized infection became a necessary routine in dealing with chronic arthritis, but it soon was evident that infection could account for but a part of the complex etiology of the disease.

During the same period of the past quarter century, advances in the study of metabolism, heredity, water balance and edema, of the functions of the thyroid and parathyroid glands and of the effect of nervous and vascular supply on nutrition of joints furnished clinical methods that were utilizable in the study of arthritis.

At this time came the World War, with the revelation of the large number of persons unfitted by physical disability for inclusion in the draft, the opportunities for study of arthritis under controlled conditions in groups of soldiers invalided by reason of exposure, infections and trauma and finally the disclosures of health surveys, necessitated by national and local compensation laws, of the large numbers of persons in civil life who are partially or totally disabled by arthritis. Chronic arthritis has thus come to be recognized as a major cause of disability, with many possible causes which must receive adequate separate study in order that each patient may obtain a maximum benefit.

The removal of a focus of infection from some patients is sufficient to swing the balance toward recovery, and the natural recuperative powers determine healing of the arthritis. But there are many others in whom there is no evident remaining infection, and no amount of search for infection, nor attempts at immunization or desensitization, can be expected to benefit arthritis the continuance of which is dependent on dietary errors, on metabolic disturbances, on vascular abnormalities leading to malnutrition of cartilage, on nervous and trophic derangement or on hereditary or mechanical defects.

When an infection invades a previously normal knee joint the lesion may heal promptly without residual disability, or healing may be delayed. There is exudation, stimulation of connective tissue growth, pannus formation and erosion of cartilage; the joint surfaces are no longer in proper apposition, the blood supply is impaired so that healing is further interfered with, and the trauma of motion and weight bearing accentuate a process from which the initial active infectious cause may have abated or disappeared. It has been suggested that the extensive and progressive disorganization of joints with impaired function in some patients is due to inferior quality of cartilage, which is less able than the normal to withstand infection and injury or to participate in repair.

Any one of several causes may thus initiate the arthritis, but almost without exception other disturbances follow, so that in any patient with chronic arthritis there are several determinants affecting the progress of the disease.

CLASSIFICATION

In a disease characterized by deformity of joints of varying clinical course, in the etiology of which such diverse elements as infection, trauma, glandular dyscrasias, hereditary inferiority of tissues, altered blood supply and the nutritional changes attendant on advancing age are concerned, it is evident that the first requirement for routine study is a workable classification.

Many attempts have been made to divide arthritis into groups on the basis of morbid anatomy, etiology or clinical course. After long consideration it was concluded by the American committee that, in the circumstances, a simple division of chronic arthritis into (1) chronic atrophic, rheumatoid arthritis and (2) chronic hypertrophic arthritis, osteo-arthritis, will serve best for the present.

The characteristics of atrophic arthritis are its incidence chiefly in younger persons of ptotic habit, especially women, multiple joint involvement with fusiform appearance of joints of the hands, often ulnar deflection, and later ankylosis. The onset is insidious or acute. In many patients, constitutional effects with slight fever, anemia and poor nutrition are evident.

Hypertrophic arthritis, osteo-arthritis, is found in persons at or beyond middle life, often well nourished, and produces disability varying from slight to severe crippling. It is usually polyarticular but may be monarticular. Lipping of joints and hyperostoses are frequent; ankylosis is rare. Fibrous thickenings, Heberden's nodes, with later bony hyperplasia at the terminal joints of the fingers, are frequent. The effects of the trauma of work are often noted in the hands and spine of the laborer.

The committee of the British Medical Association has summarized its studies in an admirable report[2] in which is offered a somewhat more detailed subdivision of clinical and pathologic types. Both rheumatoid arthritis and osteo-arthritis are regarded as having two types, one with and a second without infection. There are added chronic villous arthritis, occurring mainly in women at the menopause, and spondylitis. Of the latter, two types are distinguished: (*a*) ankylopoietica in which the joints of the spine tend to fuse and in which infections as well as trauma are often concerned, and (*b*) osteo-arthritica, laborer's spine, in which the effects of wear and tear of hard work are evident and osteophytic outgrowths prominent.

The grouping of chronic arthritis into atrophic and hypertrophic should be regarded as tentative, to clarify discussion and facilitate clinical study. Some students of arthritis believe that the two groups represent clinically different diseases. Certainly the onset of disease in many patients with the atrophic type is associated with infections and, in many of those suffering from the osteo-arthritic, hypertrophic type, the anatomic alterations are clearly dependent on vascular and other tissue changes that characterize senescence. There are, however, borderline cases which it is difficult to place in one or the other group. Pathologic tissue changes characteristic of each group are sometimes found in the same patient, and roentgen films of some joints suggest the atrophic, while those of other joints, such as of the spine, suggest the hypertrophic type of arthritis. The

2. Causation and Treatment of Arthritis and Allied Conditions, Brit. M. J. **1**: 1033 (June 17) 1933.

kind of trauma and the location of the joint thus seem to determine in part the reaction that occurs.

Other clinicians, while admitting the desirability of a working classification of this sort, maintain that the pathologic and clinical differences between the two groups depend on the time of life when damage, whether due to infection, physical trauma or interference with nutrition, occurs, and on the kind of reaction to injury exhibited by the tissues of the individual patient. Gonococcic infection produces in one patient a quickly healing arthritis; in another, arthritis and tenosynovitis with limitation of motion from scar tissue and adhesions; in still another, a multiple arthritis which continues to progress to the clinical picture of advanced atrophic arthritis, or to the production of spondylitis ankylopoietica of the British classification.

The effect of age on the response of joints to injury is demonstrable in animals. Experimental ligation of the blood supply of the patella produces a hypertrophic type of arthritis in adult dogs but causes but little change in young dogs.[3] Clinically, the hypertrophic type of chronic arthritis in man is more common in older persons, whereas the atrophic type appears in earlier decades of life. Again, in atrophic arthritis there is sometimes clearly evident a hereditary element, as shown by the incidence of arthritis in some families, as in grandmother, mother and daughter. Here is suggested a cartilage inferiority as regards healing and reaction to infection or trauma, analogous to family susceptibility or resistance to infectious diseases, to the early development of hypertension or to local tissue reaction in scars, in which in one person a cut of the skin heals with a slight scar and in another with an unsightly keloid.

In chronic arthritis one is therefore dealing with a disease which may be initiated by infection or trauma but the subsequent course of which is influenced by many conditions of individual and hereditary tissue peculiarity, age, and general and local nutrition.

The usual combinations of these conditions result in a disease that conforms clinically more or less closely to one or the other of the two great groups of atrophic or hypertrophic arthritis. It is to be noted that while such a division is extremely valuable clinically, it does not justify the assumption that one factor, such for example as infection, was or was not the precipitating cause of the disease years before. Infection may have initiated the process the later course of which is determined by the kind of response that the tissues are able to make by reason of their hereditary quality, vascular supply and exposure to further trauma.

Viewed in this way, the grouping of chronic arthritis into atrophic and hypertrophic is really a statement of how this or that patient has reacted to trauma involving his joints and is of value because it indicates the kind of problem, judging from previous clinical experience, he is likely to present in the future, as well as the difficulties he will encounter, and the measures to be taken to avoid them.

TREATMENT

The treatment of chronic arthritis consists in the removal or correction of such recognizable causes as may be found active when the patient comes for help, the prevention of mechanical defects and the correction of those already present, and the institution of general measures to return the patient and his tissues to as normal a condition as possible. The patient and his disease are to be treated rather than his joints or one assumed etiologic factor alone. Successful management will depend on a highly individualized program, which ideally will meet the several requirements of each patient. Routine treatment of all patients by any one method cannot in the nature of the case succeed.

Before the several lines of therapeutic attack on chronic arthritis are considered, it is well to recall the natural history of the disease. In some patients the arthritis seems steadily to advance, but in the majority, especially the atrophic type, there are periods of spontaneous remission with improvement, which may last for months. Any harmless therapeutic measure, whether actually effective or not, will, if instituted at the beginning of a natural remission, be followed by improvement and thus be credited with a value it does not deserve. The conclusions of many studies of this or that method of treatment during the past quarter century are to a large extent invalidated by failure to take into account this tendency to remission in arthritis. Then, too, the assay of results of therapeutic measures must include subjective as well as objective elements. The report of a patient as to how he feels is influenced to a considerable extent by his state of mind, whether of hope or discouragement.

INFECTIONS

Infections frequently mark the onset of arthritis, which is destined to progress into a chronic disease. The recognition of chronic focal infection as a cause of disease of the joints is one of the great advances in medicine of this century, and the treatment of chronic arthritis properly includes a search for and eradication of chronic infections. Operations for the removal of infections obviously should be planned to avoid shock to the patient. Sometimes removal of infection will suffice to swing the balance in favor of the patient, and his recovery is assured. More often, however, infection is only one, though possibly the precipitating, factor in a process that is continued by one or usually several other factors. Here dependence on measures directed toward the infection alone will obviously result in failure. The importance of underlying hereditary and general influences is emphasized when one recalls the high incidence of focal infections in persons who do not suffer from arthritis or other demonstrable organic disease.

It is not within the scope of this paper to review the many reported results of the removal of infections in chronic arthritis. Two recent reports, however, exemplify some of the etiologic and therapeutic relationships already cited. Stainsby and Nicholls[4] treated rheumatoid arthritis by removal of the tonsils and by vaccines. Of twenty patients treated by tonsillectomy alone there was improvement in 60 per cent; of eighty-three patients treated by tonsillectomy and vaccines there was improvement in 57.8 per cent; of 194 treated by vaccine alone there was improvement in 35.6 per cent. Miltner and Kulowski[5] found that the benefit of the removal of focal infections in chronic arthritis depended on age, type of disease and its duration. Of thirty-three patients with atrophic arthritis under 16 years of age, 73 per cent were cured and 16 per cent

3. Goldhaft, A. D.; Wright, L. M., and Pemberton, Ralph: The Influence of Age in the Experimental Production of Hypertrophic Arthritis, Ann. Int. Med. **6**: 1591 (June) 1933.

4. Stainsby, W. J., and Nicholls, Edith E.: J. Lab. & Clin. Med. **17**: 881 (June) 1933.

5. Miltner, L. J., and Kulowski, Jacob: J. Bone & Joint Surg. **15**: 383 (April) 1933.

improved. Of sixty-three patients over 16 years of age, 15 per cent were cured and 58 per cent improved. Of 100 patients with hypertrophic arthritis, 95 per cent showed demonstrable foci, dental foci predominating, but in only 9 per cent was there marked improvement following their removal.

These and other studies indicate that infection is a larger contributory element in the continuation of the atrophic than of the hypertrophic group. There is diversity of opinion, based on the results of blood cultures, as to the incidence and significance of bacteremia in chronic arthritis, but most investigators have found bacteria in cultures of the blood in a larger proportion of patients in the atrophic than in the hypertrophic group. Whatever may be the final conclusion as to this controversial matter, as well as to the significance of streptococcus agglutinins, it seems quite possible that in chronic arthritis the finding of bacteria in the blood may be of greatest importance as an indication of lowered humoral and cellular resistance incidental to the general disease. Bacterial invasion of joints may occur early and be of primary etiologic importance but conceivably may follow later under conditions of lowered resistance in a patient whose arthritis originally resulted from a combination of other causes.

ALLERGY

Evidence is growing that part of the symptoms of recurrent joint pain and swelling may be due to an allergic response of sensitized joint tissues rather than to actual new lodgment of bacterial bodies. Both experimental and clinical observations suggest an analogy between the urticaria and rashes of serum disease and the shifting swelling, redness and pain of the joints in acute rheumatic fever. Likewise in chronic recurrent iritis many facts favor the view that some recurrences are due to reactions of the uveal tract previously sensitized by infection, through the renewed invasion of the ocular tissues, not by bacteria but by proteins possibly of bacterial origin. Applying this concept to chronic arthritis, exacerbations of joint swelling and pain may thus result from superficial mucosal infections such as result from minor colds. The cause of the exacerbation may thus be infectious but not associated with any hidden or deep seated removable infection. Patients in whom there remains no demonstrable focus of infection frequently suffer from recurrence of arthritis following acute respiratory infections and colds.

Freedom from exposure to streptococcic infections, as demonstrated by Coburn in the treatment of patients with rheumatic fever by their removal to Puerto Rico, where streptococcic infections are rare, and the favorable effect on patients with chronic arthritis and chronic sinus infections of a sojourn in the dry climate of the Southwest emphasize the importance of preventing renewed exposure to superficial infections. Prevention here consists not in renewed search for hidden foci but in decreasing the probabilities of exposure to infection and in improving general nutrition and resistance.

VACCINES

Treatment by the injection of vaccines, usually of streptococcic origin, is widely practiced, and undoubted instances of improvement under this treatment have been reported by excellent observers. It must be evident however that, in a disease in which in each case several causes are almost always active, dependence on one method alone results in the neglect of other procedures of equal importance to the welfare of the patient and, if vaccines are used in combination with other necessary methods, much caution is needed in evaluating the contribution of vaccines to the improvement. Too often in the past the natural history of arthritis with its spontaneous periods of remission and exacerbation has been forgotten.

GENERAL MANAGEMENT

With the conception of chronic arthritis as a disease affecting the entire body rather than the joints alone, the plan of treatment at once is broadened and individualized for each patient. There is no single accepted or acceptable method of treatment of chronic arthritis. It is here possible only to refer to general principles.

Early recognition and treatment of the condition that threatens the patient offers the greatest hope of reducing invalidism from this cause in years to come. In patients first seen when the disease is more advanced, much can still be done to prevent deformity and ankylosis, and, if ankylosis seems inevitable, to maintain the joints in the most useful functional positions.

In atrophic arthritis the restoration of general nutrition is of first importance and is often extremely difficult, requiring for its attainment relief from pain, relative or complete bed rest, and removal of sources of nervous irritation and worry, in addition to a balanced diet.

The diet should be appetizing and include an abundance of vegetables and fruit, protein and fat. Food idiosyncrasies, if present, must be considered in arranging the dietary. Long illness and poor appetites often lead patients to take habitually an excess of concentrated carbohydrates, and lack of exercise further interferes with carbohydrate and other metabolism. Pemberton has found that decrease in carbohydrates with increase in proteins and fats favors reduction in joint swellings. The replacement of concentrated carbohydrates with protein, fat, vegetables and fruits increases the vitamin content of the food and supplies a residue that aids in the correction of the tendency to bowel atony and constipation.

The administration of small doses of thyroid substance sometimes stimulates the appetite, increases the sense of well being of the patient and, when hypothyroidism is present, may contribute to resistance to infection. Anemia often requires the reinforcement of the diet with iron. Although many patients with atrophic arthritis are underweight, some tend to become fat, especially if they are confined to bed, and here the diet, particularly the carbohydrates, must be reduced. In hypertrophic arthritis occurring in patients with a tendency toward overweight or obesity, reduction in carbohydrates and in the total diet contributes to general improvement as well as to reduction of the load on weight-bearing joints. The relief of pain by suitable analgesics such as those of the salicylic group is necessary for the comfort of the patient. The dangers of the use of a number of newer drugs, such as cinchophen for long periods, have been demonstrated by the tragic experiences of recent years.

Referred pain, arising from pressure or irritation of spinal nerves in osteo-arthritis, and requiring careful study to distinguish it from pain originating in the heart, abdominal viscera or peripheral nerves, is often relieved by intelligent application of corrective orthopedic measures.

The benefits of orthopedic measures to correct deformities and increase the functional usefulness of

joints are not confined to the joints. The patient, bedridden until the contractures of the knees were corrected, is now able to walk and take exercise, has an improved appetite, assimilates food better and, most important of all, has now a hopeful instead of a hopeless attitude toward life.

Physical therapeutic measures to improve circulation and local nutrition by massage, heat cautiously applied in suitable cases, exercise in the main active rather than passive, and heliotherapy, natural and artificial, may be applied to meet the special conditions in each case.

SUMMARY

Arthritis is a major cause of suffering and disability, and it entails economic distress greater than that of any other disease in temperate climates. The several factors concerned in the onset and continued course of chronic arthritis include infection, trauma, interference with normal blood and nerve supply, hereditary cartilage and tissue inferiority, and general causes such as fatigue, exposure, nervous strain, general malnutrition and glandular dysfunction.

Chronic arthritis is to be thought of as a disease that affects the body as a whole rather than the joints alone. For clinical purposes this disease is divided into two groups, atrophic or rheumatoid arthritis, and hypertrophic arthritis or osteo-arthritis, although it seems possible that these types often represent the results of similar series of events in persons of different ages and intrinsic qualities of tissues.

Treatment must be highly individualized to meet the several requirements of each patient. The employment of one method of treatment for all patients, in a disease whose etiology and course vary with each patient, seems unwarranted. There is also the danger that relatively minor procedures such as some dietary, physical therapeutic or other measures, perhaps valuable in themselves, may be unduly stressed in the clinic so that patients are given an erroneous impression of their importance. Here as elsewhere in medicine there is constant need of rugged honesty, both moral and intellectual, and sincerity of purpose.

Treatment based on the broader conception of chronic arthritis as a general disease will meet the requirements of a larger number of patients, and the percentage of cures or marked improvement will be increased. While a spirit of optimism is necessary in this difficult field, it must still be recognized that there will be some patients whose disease is far advanced for whom but little can be accomplished. The number of these will be materially decreased as adequate broad visioned treatment is instituted at an earlier stage, before irreparable damage has been done.

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Invention of Histologic Technic.—In 1835 Purkinje, an Austrian priest of Gipsy family, became possessed of a microscope. In a short space of time he had discovered the nerve cell, and this discovery, added to that of Gall of the nerve tract, was the instigation of all later work. He had invented a hardening reagent, bichromate of potash, which would allow sections of soft tissue to be cut; a machine, the microtome, to cut the sections; a stain, carmine, which would bring out the details; a clarifying reagent, oil of cloves, which would make microscopical examination possible; and a method of making permanent preparations with Canada balsam. Purkinje's work was epoch making in the progress it caused.—Collier, James: The Harveian Oration on "Inventions and the Outlook in Neurology," *Brit. M. J.* **2**:707 (Oct. 20) 1934.

THE MEDICAL TREATMENT OF CHRONIC ARTHRITIS

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It is customary nowadays to open any discussion on the treatment of chronic arthritis with a preliminary paragraph on the classification of the disease. This is a rational procedure, but unfortunately the terminology now in use is confusing to many physicians, chiefly because of the multiplicity of synonyms. Many of these synonyms might well be forgotten. As a matter of fact the modern classification of chronic arthritis is quite simple, much simpler than that of chronic nephritis or chronic heart disease. The differentiation of chronic arthritis into two groups has resulted largely from careful pathologic studies of the disease, but there are definite clinical features of each type as well.

Pathologically the two great groups are so different that it is hard to see how any one could confuse them. Osteo-arthritis, or hypertrophic arthritis, is well named, because it is a degenerative process which affects the bone and cartilage. The term hypertrophic arthritis is also appropriate because of the hypertrophic changes that take place in the bone around the margins of the articular surface. Pathologists look on osteo-arthritis as a senescent process similar to arteriosclerosis or gray hair. Keefer and Myers[1] have recently shown that these degenerative changes in the joint are present in a high percentage of old people who come to autopsy after death from some other malady. In other words, hypertrophic arthritis is hardly a disease but a natural biologic process and simply one phase of senescence. The Germans and French often speak of this condition as an "osteo-arthrosis," a term which would indicate that it is not inflammatory in nature. Hypertrophic arthritis is characterized by some enlargement of the ends of the bone and by an absence of soft tissue swelling. Ankylosis does not occur in this form of arthritis.

Rheumatoid arthritis, or chronic infectious arthritis, is a chronic progressive inflammatory disease, characterized in its early stage by migratory pain and swelling in various joints and in the later stages by ankylosis and deformity. Because of its capacity to cripple, it presents one of the great public health problems of civilization. The belief is quite general that rheumatoid arthritis is a chronic infection, and there are a considerable number who look on it as a chronic streptococcic infection. In contrast to hypertrophic arthritis, the joints in rheumatoid arthritis usually show soft tissue swelling.

If one limits oneself to the aforementioned terms, it would seem that the differentiation between these two types of arthritis is simple enough. It must be admitted, however, that there does exist a so-called mixed type of arthritis in which in addition to soft tissue swelling of one or more joints, definite changes in the bone and cartilage are also present. The existence of this mixed type leads Rigler and Wetherby,[2] and more recently Archer,[3] to conclude that hypertrophic

Read before the Section on Practice of Medicine at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 14, 1934.

1. Keefer, C. S., and Myers, W. K.: The Incidence and Pathogenesis of Degenerative Arthritis, J. A. M. A. **102**: 811 (March 17) 1934.
2. Rigler, Leo, and Wetherby, Macnider: Roentgen Findings in Chronic Polyarticular Arthritis, Am. J. Roentgenol. **29**: 766 (June) 1933.
3. Archer, B. H.: Chronic Nonspecific Arthritis, J. A. M. A. **102**: 1449 (May 5) 1934.

and rheumatoid arthritis are "different manifestations of the same disease." If this were the case, there would certainly be little reason for classifying chronic arthritis at all. This confusion, which exists in the minds of some, results, I believe, from inadequate study of the life history of the two diseases. If, as already pointed out, hypertrophic arthritis is present in almost a hundred per cent of eldery patients, it is hard to see how it could have any possible connection with rheumatoid arthritis, which usually appears in the earlier decades of life and which, in its incipient stage, is purely a synovial disorder characterized by no changes whatever in the bone or cartilage. Archer finds it difficult to understand how a patient could have a Heberden's node (of hypertrophic origin) on one joint and a rheumatoid enlargement of another joint on the same finger or even on the same hand. However, there is nothing to prevent a gray-haired old man from contracting an infectious seborrhea, and there is no reason why an old woman with Heberden's nodes should not contract an infectious arthritis, provided she has a focus of infection and her general resistance becomes sufficiently lowered. In other words, what has the existence of Heberden's nodes to do with contracting an infectious disease, whether it is tuberculosis or rheumatoid arthritis?

But there is another phase to this question of so-called mixed arthritis, a term, by the way, which seems to me unnecessary. It is a well known fact that any chronic irritation in a joint, if maintained long enough, will eventually lead to hypertrophic changes in the bone. This has been demonstrated repeatedly on animals by injection of sand and other foreign material into the joint cavity. Fractures that involve the articular surface of a bone often lead to subsequent hypertrophic changes in the joint, regardless of the patient's age. One of the commonest of all irritants is infection. Any chronic infection of a joint may lead, in the course of time, to more or less hypertrophic change in the joint affected. For example, both gonococcic arthritis and tuberculous arthritis may lead eventually to hypertrophic bony changes. This is no reason, however, for calling gonococcic arthritis and tuberculous arthritis "different manifestations of the same disease." Rheumatoid arthritis, like other infections of the joints, is no exception to this rule. Starting as an inflammation of the synovial membrane, the original infection may be complicated finally by osteo-arthritic manifestations.

The time to determine the nature of a morbid process is in its incipience. In the late stages of any chronic disease the picture becomes so blurred by many complicating factors that the real character of the pathologic process is readily obscured.

TREATMENT OF HYPERTROPHIC ARTHRITIS

If, as I have already stated, hypertrophic arthritis is a senescent lesion, one cannot hope to cure it in the real sense of the word. Fortunately many individuals with this type of arthritis do not need a cure, because they have no symptoms. Symptoms develop when a hypertrophic or "worn-out" joint is subjected to acute or chronic trauma. This trauma is referable in many cases to overweight, especially when the symptoms occur in the weight-bearing joints. However, the trauma may result from many other causes, such as occupation, bad posture and deformities. The obvious method of treating this condition, therefore, is first to remove the cause. The patient cannot be cured of his senescent joint changes, but he can often be relieved of his symptoms if the proper therapeutic measures are employed.

First, then, under the medical treatment of hypertrophic arthritis is removal of the source of trauma to the affected joint. When the symptoms are in the knees, the condition can usually be traced to overweight. There is one special type of hypertrophic arthritis that is seen very frequently in the clinic. A middle-aged woman, considerably overweight, comes in complaining of pain and stiffness in the knees, Heberden's nodes on the fingers and often pain and stiffness in the lumbar spine. This syndrome appears so frequently at the time of the menopause that it has been called menopausal or climacteric arthritis. These patients are often greatly relieved by the simple expedient of reducing the weight from 20 to 25 pounds (9 to 11 Kg.) by means of a low calory diet. If the basal metabolism rate is below normal, thyroid extract can be administered with benefit.

The next most important phase of the treatment of hypertrophic arthritis is cessation of overactivity of the joint. By this I do not mean complete rest or immobilization but considerably less exercise than the patient has been accustomed to take. Many of these middle-aged or elderly patients are convinced that excessive exercise is the road to cure, not realizing that the relief they obtain from exercise is only temporary and that the joint is being subjected to additional injury by such measures.

This type of obese middle-aged patient usually suffers from constipation and the intestinal tract should receive attention. There is nothing better in my opinion than the well known combination of agar and liquid petrolatum. Sometimes a roughage diet consisting chiefly of fruits and vegetables will answer the purpose.

Many patients with hypertrophic arthritis get relief from a visit to one of the spas. Rest, relaxation and possibly the copious drinking of water do as much for the patient as the baths and physical therapy.

Drugs are of very little value in this form of arthritis. Salicylates can be employed to relieve pain, and iodides are said to be helpful in some cases.

Heat in all its forms is extremely valuable and is discussed by Dr. Loring T. Swaim under the heading of "The Orthopedic and Physical Therapeutic Treatment of Chronic Arthritis."

TREATMENT OF RHEUMATOID ARTHRITIS

Rheumatoid arthritis is one of the great diseases of medicine. The etiology of this arthropathy is still under debate and cannot be discussed at length in this paper. Suffice to say that rheumatoid arthritis has a specific pathology and a characteristic syndrome, and that in most quarters it is looked on as a chronic infection. A good deal of work has been done on the bacteriology of rheumatoid arthritis, and a number of investigators have succeeded in recovering streptococci from the blood and joints of patients suffering from this disease. Other bacteriologists have failed entirely in their attempts to recover streptococci from the lesions of rheumatoid arthritis. This discrepancy in results is difficult to explain but is possibly referable to minor differences in culture mediums. Some have suspected that the streptococci in question were contaminations from the air or skin, but it is hard to reconcile such a theory with the carefully controlled studies of Callow,[4] who found streptococci in the blood of a high percentage

4. Callow, B. R.: Bacteriologic Investigation of the Blood in Rheumatic Fever, J. Infect. Dis. **52**: 279 (May-June) 1933.

of patients with rheumatic fever. Callow's studies were carried out under the direction of William H. Park, who presumably would have recognized contaminations as such. If time and space permitted, other evidence such as the presence of specific streptococcus agglutinins and precipitins in the serums of rheumatoid patients could be cited in support of the streptococcic origin of rheumatoid arthritis.

If current ideas about the infectious nature of rheumatoid arthritis are correct, the treatment of this disease should be quite different from that which has just been outlined for senescent osteo-arthritis. In the latter condition the elimination of trauma and stimulation of the local circulation are the important factors. If, however, in rheumatoid arthritis one is dealing with a chronic infection, the therapeutic approach should be similar in a general way to that which would be taken toward any other chronic infection. Unfortunately the treatment of rheumatoid arthritis suffers for lack of standardization. Stokes and his associates [5] recently published an article on the "standard treatment" of syphilis. A similar article could be written on the standard treatment of tuberculosis. It would be very difficult, however, to write an article on the standard treatment of rheumatoid arthritis for the simple reason that there is no standardized therapy for this disease. I have often thought that it would be an interesting experience for an arthritic patient if he should start in Boston and make a circuit of the United States and Canada, taking the treatment for his disease in various medical centers as it was prescribed by the leading authorities in those communities. In some places focal infection would be stressed. In other clinics he would receive vaccine. In still others he would be put on a rigid dietary regimen, and finally he might receive physical therapy and orthopedic treatment.

In order to get some general idea as to how the various forms of treatment for rheumatoid arthritis should be rated, I recently sent a questionnaire to sixteen of my friends in various parts of America who are interested in rheumatoid arthritis. With one or two exceptions, these men are professors in leading medical schools and all of them have an excellent background in the handling of arthritic patients. In the questionnaire I asked these physicians to rate by number the importance of the following methods of treatment:

Blood transfusions.
Climate cure.
Foreign protein therapy.
Hydrotherapy.
Hyperthermia.
Intestinal hygiene (including colonic irrigations, purgatives and the like).
Low carbohydrate diet.
Drugs.
Physical therapy (including massage and exercise).
Removal of foci of infection.
Rest.
Streptococcus vaccine.

The sixteen physicians were also asked to make any comments that occurred to them concerning these various forms of treatment. I realized, of course, that this was a very artificial method of getting at the relative merits of twelve different forms of therapy, but it occurred to me that by means of such a questionnaire I might be able to draw certain conclusions concerning the trend of modern therapy in rheumatoid arthritis.

The answers were interesting and fulfilled very well the purpose of the questionnaire. The results ran about as follows:

Blood transfusions did not evoke much enthusiasm. None of the voters rated them high on the list. Several remarked that they were useful in patients with marked anemia.

The climate cure got a much better reception. It was given honorable mention (first, second or third place) in five out of the sixteen questionnaires. Several voters mentioned the fact that a dry hot climate, such as that of Arizona or New Mexico, is especially good for arthritic patients who are also suffering from sinus infection.

Foreign protein therapy got a very lukewarm response. None of the voters placed it high on the list, though one physician remarked that typhoid vaccine was his favorite treatment in active cases. The general reaction to foreign protein treatment was that it was a rather highly specialized form of therapy for special cases.

Hydrotherapy received only one vote in the first three places, and the general opinion was that it was of value chiefly in the relief of symptoms.

Hyperthermia by means of the "short wave" or diathermy elicited very little enthusiasm. One physician remarked that there was no theoretical basis for it, as it would deplete an already ill patient rather than build him up.

Intestinal hygiene, including colonic irrigations, purgatives and so on received only one honor vote, and this was third place. One physician writes "I feel convinced that if one attended to intestinal hygiene per se he would get nowhere, unless under intestinal hygiene the concept of a proper diet was included." Another voter aptly remarks "One should pay the same attention to intestinal hygiene in the arthritic as in any other ill patient."

A low carbohydrate diet received fairly enthusiastic support, getting "honorable mention" in five out of sixteen questionnaires, though it did not receive first place in any of the lists.

Drugs did not receive honorable mention in a single questionnaire. One doctor writes "Drugs should be considered a very minor aspect in the treatment of arthritis." Iron of course was mentioned frequently as indispensable for secondary anemia. All agreed that salicylates were of value only for their analgesic effect.

Physical therapy, including massage and exercises, received on the whole rather enthusiastic support, getting honorable mention in eight out of sixteen questionnaires. Even here, however, there were skeptics. One voter writes "No results after large experience." Another writes "Physiotherapy may give symptomatic relief but is not a cure. With some patients the fatigue following treatment does more harm than good."

Removal of foci of infection is evidently a popular therapeutic measure, as it received "honorable mention" in eleven of the sixteen questionnaires. In seven questionnaires it received first place, in three second place and in one third place. Several voters, however, stressed the apparent futility of removing foci of infection late in the course of the disease.

Rest received the highest number of "honors." Twelve out of sixteen voters gave it honorable mention,

5. Stokes, J. H.; Cole, H. N.; Moore, J. E.; O'Leary, P. A.; Wile, U. J.; Parran, Thomas Jr.; Vonderlehr, R. A., and Usilton, Lida J.: Standard Treatment Procedure in Early Syphilis, J. A. M. A. **102**: 1267 (April 21) 1934.

and in seven questionnaires rest received first place. Several physicians stressed the importance of mental as well as physical rest.

Streptococcus vaccine, either stock or autogenous, met with only moderate enthusiasm. It received honorable mention in five out of sixteen questionnaires. Some of the voters were frankly skeptical concerning its beneficial effects. Others felt that whatever virtue resided in streptococcus vaccine was nonspecific in character.

Summarizing, then, it may be said that this questionnaire, though admittedly a very rough gage, brought out the following facts: Apparently the most popular therapeutic measures at present in vogue in the treatment of rheumatoid arthritis are rest, removal of focal infections, and physical therapy. Climatotherapy is also held in considerable esteem, while a low carbohydrate diet and streptococcus vaccine both received a fair amount of recognition. Through an oversight, vitamins were not listed in the questionnaire, but a number of physicians, in discussing diet or medication, spoke of vitamins as an important part of their treatment of rheumatoid arthritis.

AUTHOR'S METHOD OF TREATMENT

My own method of treating rheumatoid arthritis is based on experience that has come from the handling of these patients in the outpatient clinic, in the hospital ward, and in private practice. The treatment differs somewhat with the duration of the disease and the degree of its activity. As a matter of convenience in discussing the therapy of this disease, the cases may be divided roughly into four groups, representing four different stages or aspects of it:

1. Mild early cases.
2. Active febrile cases.
3. Well established chronic cases.
4. Advanced bedridden cases.

GROUP 1.—*Mild Early Cases* (from three to eighteen months' duration).—This type of rheumatoid patient is usually seen first in the outpatient clinic or in office practice. The patient is often a young adult, though he may be of any age. The disease is still in its early phases and the cartilage of the joints has suffered little or no injury. The symptoms are mild and the disease is running a sluggish course. There may be several fusiform fingers, one or two swollen knuckles, discomfort in the wrists and often swelling or pain in the knees or ankles. None of the joints show ankylosis or deformity.

The diagnosis is based on the clinical picture, an accelerated sedimentation rate of the red blood cells and often a slight increase in the immature cells of the blood. About 60 to 70 per cent of these early cases will show specific agglutinins for Streptococcus hemolyticus.

(*a*) Foci of Infection: The therapeutic procedure that I consider of first importance in this type of case is the removal of focal infections. If the tonsils appear to be infected, or even if they are under suspicion and if the patient is under 50 years of age, a tonsillectomy will probably be recommended. It has been learned from experience to distrust all tonsils. I am much more conservative in my attitude toward devitalized teeth and rarely advise their extraction unless there is definite evidence of periapical infection. In respect to sinuses, the advice of a good laryngologist is sought, preferably one who is not too radically minded, and I am very prone to follow his advice with regard to the treatment of whatever sinus infection exists. The possibility of infection in the genito-urinary tract and other parts of the body is also eliminated.

A great deal of success in the treatment of focal infection depends on who removes the focus. A tonsillectomy performed by a clumsy operator is more apt to bring on an exacerbation of joint symptoms than it is to cure the patient. I believe that it is better treatment to remove the focus and then build up the patient than it is to build up the patient and then remove the focus.

(*b*) Rest: I agree with the physicians who answered the questionnaire that rest is a very vital part of the treatment of rheumatoid arthritis. In this ambulant type of case, however, rest is a difficult form of therapy to enforce, chiefly because the patient, whether man or woman, is anxious to keep up the daily routine of duties. If these patients in the early stages of rheumatoid arthritis can be persuaded to give up work and take a rest cure for from six months to a year, a much higher percentage of them would make a complete and permanent recovery. As it is, and chiefly perhaps because of economic reasons, the physician must compromise on the rest issue, and the patient is advised to take from one to two hours' rest in bed every day after lunch. If a real rest cure can be taken away from home, it is far preferable, because the patient gets a mental and emotional rest as well as a physical one.

(*c*) Vaccine: Most rheumatoid patients in this early group receive streptococcus vaccine intravenously. The vaccine is a stock hemolytic streptococcus vaccine, prepared from several "typical strains" recovered from the blood and joints of patients with rheumatoid arthritis[6] and all of which are agglutinated by the serum from rheumatoid patients. I have no intention of giving up streptococcus vaccine in the treatment of rheumatoid arthritis because of a certain reaction that exists now in various quarters against its use. I have seen too many patients improve under this form of treatment to question its value in a considerable number of cases. No doubt vaccine therapy has been abused, chiefly by those clinicians who have given vaccine and ignored other important phases of the treatment; but Streptococcus hemolyticus vaccine given in small doses by the intravenous route seems to me to have a definite place in the therapy of rheumatoid arthritis.

The streptococcus vaccine, as it is employed, is made up in various dilutions for intravenous therapy. Dilution 1 contains 1 million streptococci to 1 cc. of vaccine. Dilution 2 contains 10 million streptococci to 1 cc. Dilution 3 contains 100 million streptococci to 1 cc., and dilution 4, 1,000 million. The first dose is usually 0.05 cc. of dilution 1 (50,000 streptococci) intravenously. Each succeeding dose is increased by 0.05 cc. When a dosage of 1 cc. has been reached, treatment with dilution 2 is started with 0.1 cc., and the dosage increased by 0.05 cc. with each injection, and so on through dilution 3.

If for any reason the intravenous method is contraindicated, the subcutaneous route can be used. For this method, Streptococcus hemolyticus vaccine contains one billion streptococci to each cubic centimeter of vaccine. The first dose is 0.05 cc. Each succeeding dose is increased by 0.05 cc. but rarely exceeds 1 cc.

6. Cecil, R. L.; Nicholls, Edith E., and Stainsby, W. J.: The Bacteriology of the Blood and Joints in Chronic Infectious Arthritis, Arch. Int. Med. **43**: 571 (May) 1929; The Etiology of Rheumatoid Arthritis, Am. J. M. Sc. **181**: 12 (Jan.) 1931.

In both the intravenous and the subcutaneous method the interval between doses should be from four to five days. If the patient has a severe local or mild general reaction with definite increase of joint pain following the injection, the previous dose of vaccine is repeated or the amount reduced. A large part of the success in vaccine therapy depends on the persistence with which it is prosecuted. As a rule, very little benefit can be expected during the first two or three months of treatment. The injections should therefore be continued for at least three or four months.

It is very important in using streptococcus vaccine to avoid overdosage, especially when the intravenous method is employed. An overdose of foreign protein or typhoid vaccine may cause a chill and fever and still react favorably on the patient's symptoms. On the other hand, an overdose of streptococcus vaccine by the intravenous route may bring on an acute and sometimes a severe exacerbation of symptoms in the joints. Episodes of this kind probably have an allergic basis. It seems likely that whatever virtue streptococcus vaccine has in rheumatoid arthritis is more in the nature of a desensitizing function than an immunizing one.

(*d*) Drugs: Drugs play a comparatively minor part in the treatment of rheumatoid arthritis. The few that I do use, however, are important. Iron in the form of ferric ammonium citrate or reduced iron is valuable in counteracting the secondary anemia, which is so common in this disease; and arsenic seems to have a beneficial effect in many cases. One is very prone to use both of these drugs in treating early ambulant cases. I have been quite disappointed in the results obtained from various forms of sulphur and the various preparations of iodine that have been recommended. The salicylates of course are helpful in relieving pain but have no specific effect on the course of the disease.

My experience with gold salts in the treatment of rheumatoid arthritis has been rather limited. However, the results reported by Forestier [7] in France and by Slot and Deville [8] in England are very encouraging. Forestier considers sodium gold thiopropanol sulphonate the best chemical agent for the treatment of rheumatoid arthritis. Slot and Deville assert that in rheumatoid arthritis the results of gold therapy are superior to those of all other methods of treatment. In their opinion gold therapy marks a distinct advance in the treatment of this disease. Patients whom I have treated by this method have never shown very striking results. Perhaps a larger experience with gold therapy, however, might change my opinion.

(*e*) Low Carbohydrate Diet and Vitamins: Practically all of my patients in this group of early mild cases are put on a low carbohydrate maintenance diet, which is reinforced by a vitamin program. The vitamins usually employed are (1) vitamin A in the form of concentrated cod liver oil (or haliver oil), preferably in capsules, (2) vitamin B in the form of brewers' yeast or some of the specially prepared forms of wheat germ such as embo or bemax, (3) vitamin C as orange juice and tomato juice, and (4) vitamin D in the form of viosterol. This is taken in capsules with the cod liver oil. It must be acknowledged that this form of therapy is largely empirical, though the studies of Fletcher [9] would indicate that vitamin B has value in correcting the atony of the colon, which is so frequently seen in chronic arthritis; and more recently the studies of Rinehart [10] would indicate that a vitamin C deficiency might have some relation to rheumatoid arthritis. Rinehart has shown that joint lesions with a pathologic condition quite similar to that of rheumatoid arthritis can be produced in guinea-pigs that have been subjected to a vitamin C deficient diet and then injected intracutaneously with virulent streptococci.

(*f*) Elimination: I believe in elimination through the bowels, the bladder and the skin, but of the three elimination through the intestinal tract is the most important. Agar and liquid petrolatum are excellent for obtaining regular bowel movements, but in some cases more drastic measures may be necessary. I have seen very few patients benefited by colonic irrigations.

(*g*) Baths: Much has been written about baths of every kind in the treatment of rheumatoid arthritis, but the significant factor in all of them is probably heat. I recommend hot baths to all patients with rheumatoid arthritis as one method of giving them temporary relief of symptoms. It is not generally realized that several degrees of fever can be readily produced in a patient by the use of a very hot bath. The formula that I use is as follows:

BATH FORMULA

The tub is filled with hot water at a temperature of about 100 F.

The patient gets in the bath, and the temperature of the bath is gradually raised to 104 F.

The bath is maintained at this temperature by means of a bath thermometer, and the patient remains in the bath, submerged up to the neck, for from thirty to forty-five minutes.

A cold wet towel can be applied to the forehead to lessen the discomfort.

The patient should then be sponged off with cold water or alcohol and go to bed.

This bath should be taken on an empty stomach. The patient can take some food, preferably liquids, after the bath is over.

(*h*) Physical Therapy: Under physical therapy are included heat in various forms, massage and active and passive exercises. Most patients with rheumatoid arthritis feel better when the painful joints are subjected to heat, but this is not a universal experience. In some instances the pain is actually increased by the application of diathermy or infra-red rays. The value of physical therapy and the various forms of exercise are discussed in detail by Dr. Swaim.

(*i*) Climate: I believe in the beneficent effect of a warm dry climate with minimal barometric variations. Holbrook [11] has recently written an interesting and helpful article on the treatment of rheumatic arthritis and in this article he discusses climatic therapy at considerable length. I agree with Holbrook's statement that the various forms of heliotherapy constitute the major portion of specific climatic therapy. Unfortunately, a comparatively small number of rheumatoid patients can afford to make the pilgrimage to the Southwest, and those who cannot take advantage of that climate should have as much exposure as possible to sunlight at home.

(*j*) Psychotherapy: Most patients with rheumatoid arthritis suffer a great deal from mental depression and consequently need an abundant measure of psychother-

7. Forestier, Jacques: The Treatment of Rheumatoid Arthritis with Gold Salts Injections, Lancet **1**: 441 (Feb. 27) 1932.
8. Slot, Gerald, and Deville, P. M.: Treatment of Arthritis and Rheumatism with Gold, Lancet **1**: 73 (Jan. 13) 1934.
9. Fletcher, A. A., and Graham, Duncan: The Large Bowel in Chronic Arthritis, Am. J. M. Sc. **179**: 91 (Jan.) 1930.
10. Rinehart, J. F.: Does Vitamin C Deficiency Play a Rôle in Rheumatoid Arthritis? California & West. Med., to be published.
11. Holbrook, W. P.: Evaluation of Therapy in Chronic Atrophic Arthritis, Ann. Int. Med. **7**: 457 (Oct.) 1933.

apy. On the other hand, there are some individuals, usually men, who do not take their affliction seriously enough and the physician in all fairness to the patient should make clear to him the serious potentialities of the disease. The small, slender type of neurotic woman is particularly susceptible to rheumatoid arthritis and often responds poorly to treatment. It is this type of patient that needs the greatest amount of moral encouragement. Unless the physician makes very earnest efforts along this line he will fail to get the full cooperation and confidence of the patient, factors that mean much in the stubborn fight against the disease.

GROUP 2.—*The Active Febrile Cases.*—These patients are usually seen at home or in the hospital. They have a fever which may amount at times to a rise of several degrees Fahrenheit. Several joints, usually including one or both knees, are swollen, hot and painful. Some of these cases might easily be mistaken for rheumatic fever were it not for the absence of cardiac symptoms and their failure to yield to salicylates. In some instances, rheumatoid arthritis is ushered in with active febrile symptoms, though the sluggish insidious mode of onset is much more common. On the other hand, acute febrile exacerbations may develop in some of the sluggish cases following an operation, the birth of a child, an attack of grip, or some other intercurrent illness. Holbrook [11] points out that this type of case often yields dramatically to the removal of a focus of infection, and I concur with him in this point of view. In a goodly number of these patients, however, the foci have already been removed during some previous attack, and it remains for the physician to treat the condition by other medical measures. In this connection, the existence of fever and actively inflamed joints is not a contraindication to the prompt removal of a focus of infection.

In my experience the active febrile type of case responds particularly well to foreign protein, or so-called fever therapy. I cannot agree with Holbrook that "shock" therapy, either by vaccine or by nonspecific therapy, is a hazardous procedure in patients with early or subacute forms of atrophic arthritis. This is just the type of case in which fever therapy is most valuable. I am aware, of course, that a good many physicians consider foreign protein by the intravenous route a radical and rather dangerous method of treatment, but in my hands I have seen no untoward results. For this work I use triple typhoid vaccine, which in its original strength contains 2,500 million organisms. A 1:10 dilution of this vaccine is made up, so that 1 cc. contains 250 million. The first injection consists usually of 50 million bacteria (0.4 cc.), and this dose is increased with each succeeding injection until a dosage of 500 or 600 million bacteria may be reached. If the dosage is not increased with each injection, the reactions become less and less marked. I usually give the patient from six to eight shocks during his stay in the hospital.

There are some, of course, who prefer to produce artificial fever by the "short wave" or by diathermy. I have produced hyperthermia by means of diathermy in a number of cases, usually with temporary benefit, but on the whole the results have not been so satisfactory as with typhoid vaccine, and certainly the latter method is much simpler to employ. In my experience typhoid vaccine injections actually give the patient less discomfort than the hot box.

The active febrile patients usually suffer considerable toxemia and rapidly become anemic and underweight. They will need iron and arsenic in full doses. Following the suggestion of Haden,[12] I have given small doses of neoarsphenamine to these patients with very good results.

Six or seven intravenous injections of typhoid vaccine will often reduce the patient's temperature to normal and the joints will show surprising improvement. At this stage the patient may be allowed to go home and treatment can be followed either at home or by visits to the office or clinic. Occasionally actual cure will result from this regimen, but more often the patient continues to have mild symptoms in the joints and falls into the category of a group 1 case. The treatment will then become that which has already been described under the group 1 heading.

GROUP 3.—*Well Established Chronic Cases* (from two to five years' duration).—This type of case is not incurable but presents much more of a problem than the two just described. The joints will usually have suffered more extensive injury than in the first two types. The cartilage may have been partially destroyed and the synovial membrane may have become thickened. Many of these patients present a typical villous arthritis in one or both knees.

This type of case needs institutional and orthopedic care. Unfortunately, institutions for handling such cases do not exist; that is, no sanatorium has been built as yet in this country for the exclusive study and treatment of rheumatoid arthritis. There is no more pressing need in America today than for institutions that will take care of arthritic patients. Given such institutions, in charge of men who are devoting their lives to the study and treatment of the disease, many of these patients with well established rheumatoid arthritis could be eventually rehabilitated and restored to active participation in life. Ober [13] has a plan for the institutional management of arthritis in large communities. This is worth a careful study by those who are interested in the institutional treatment of chronic arthritis.

It is difficult to handle these well established chronic cases in the office or outpatient clinic. One always feels that whatever is gained by the treatment and by contact with the physician is offset by the discomforts of making the trip. This of course is not always the case. I have seen a few rather advanced cases of rheumatoid arthritis successfully handled in the office or outpatient department by a therapeutic regimen such as that outlined for the early mild cases. As a rule, however, they make some improvement at first and then become stationary.

In this type of case the medical man will need the almost constant help and cooperation of the orthopedic surgeon. Even with present institutional facilities, many of these cases yield surprisingly well to skilful treatment.

GROUP 4.—*Advanced Bedridden Cases* (of five years or more duration).—This type is represented by those unfortunate patients with rheumatoid arthritis in its terminal phase, in which treatment has availed nothing and the patient has gone on to the final stage of ankylosis and deformity. It is needless to say that little if any help can be extended to these patients by medical measures. Some of them are examples of neglect on the part either of the physician or of the patient himself.

12. Haden, R. L.: The Treatment of Chronic Atrophic (Rheumatoid) Arthritis, Tr. Am. Clin. & Climatol. A. **49**: 1 (May 9-10) 1933.
13. Ober, F. R.: A Plan for the Management of Arthritis in Large Communities, New England J. Med. **206**: 392 (Feb. 25) 1932.

There is also the type of patient who was born with a marked hereditary predisposition to the disease, and on him all forms of therapy may fail. Thanks to modern methods of treatment, fewer and fewer patients in this unfortunate group are seen. The therapeutic problem in this fourth type of case resolves itself into one of making the patient as comfortable as possible under the circumstances. Some relief can, of course, be achieved by the application of heat and massage. Such a patient demands a strong, capable and sympathetic nurse. Because of ankyloses, movement is extremely difficult and a change of position is necessary from time to time to relieve the strain and discomfort that result from lying too long in one posture.

COMMENT

In this presentation I have tried to summarize briefly my own point of view on the treatment of chronic arthritis, a point of view that is based on a fairly wide experience with the disease. This is, however, only one man's opinion, and the treatment of arthritis is still far from being standardized. I am sure it is no reflection on the men who are working on the arthritis problem to say that their opinion on the etiology and treatment of the disease changes from time to time and will continue to change until the nature of the malady is much better understood than it is at present. As I have already indicated, many physicians believe that rheumatoid arthritis is a chronic infection. My own belief is that it is a chronic streptococcic infection. But just what the underlying factors are that lead to its development, and just what factors determine recovery or progressive decline into the ankylosed state, no one pretends to know. However, much has been learned from investigation and from experience, and one can look forward with confidence to more and more light being shed on the problem during the coming years.

SUMMARY

1. The treatment of chronic arthritis differs materially for the different types of the disease.

2. Hypertrophic arthritis, being a degenerative process, is best relieved by the elimination of all trauma to the affected joints and by the application of such measures as will stimulate the local circulation.

3. Rheumatoid arthritis appears to be a chronic infection and should be treated as such.

4. Unfortunately there is no standard therapy for rheumatoid arthritis at the present time, but there are certain measures, such as rest, elimination of focal infections, physical therapy and regulation of diet, that have wide acceptance. Climatic therapy and vaccine therapy are also well thought of in many clinics.

5. My method of treating rheumatoid arthritis can be summed up in one word, "rehabilitation." This begins with rest and elimination of all foci of infection. Patients that show evidence of streptococcic infection receive streptococcus vaccine, usually by the intravenous method. In addition to these measures, a carefully regulated diet, reinforced by vitamins, adequate elimination through the intestine, bladder and skin, and carefully supervised physical therapy are looked on as valuable adjuncts in the treatment. Iron and arsenic are the most valuable drugs for building up the patient, and salicylates are in high favor for relieving pain and discomfort.

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THE ORTHOPEDIC AND PHYSICAL THERAPEUTIC TREATMENT OF CHRONIC ARTHRITIS

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The orthopedic treatment of chronic arthritis should start at the very beginning of the arthritis and should be carried along in close cooperation with the medical care.

There are three objectives in the treatment of chronic arthritis: (1) to control and stop the disease, (2) to prevent deformity during the course of the disease, and (3) to restore the patient to his normal life as functionally capable as possible. A fourth objective might be added to prevent recurrence of the disease. This might seem unnecessary but is an important factor in the follow up of every case. I consider this as important as any part of the treatment, since relapses are common.

The medical problem in the first of these objectives demanded of treatment I shall not discuss, yet there is a very practical way in which the orthopedist can materially aid in the success of the medical treatment. He can secure the best use of the body through training, just as is done in the development of every athlete; and the body resistance and strength come only with physical and functional perfection. This means good posture. Like every machine, to do its best work the body must be used correctly. The physiologic function must be as near normal as possible, especially in the chronic arthritic patient, who seems so totally unable to cope with his disease.

Faulty posture, or poor body mechanics, due to whatever cause—fatigue, carelessness, disease—does handicap the body in its work. A crumpled posture with sagged ribs causes pressure and displacement of the thoracic and abdominal organs. Their capacity to do normal work is inevitably decreased. Secretions and muscular activities are changed or inhibited entirely. Even under ideal conditions of rest, diet and hygiene this unnecessary hindrance to normal physiologic activity may prevent recovery, resistance may never be developed, and the many unknown factors may never be overcome unless the resistance of health can be secured. Such health comes only from the inside, depending on whether normal physiologic function can be restored.

OBJECTIVES OF TREATMENT

All arthritis is a constitutional disease. Inflamed joints are only a symptom of it. It seems evident that the fundamental physiology of the patient with rheumatoid arthritis is not normal. The heat regulating apparatus is disturbed. The circulation is out of order, as manifested by variations in the superficial circulation of the skin and extremities, especially the fingers and toes. These variations are undoubtedly present in other parts of the body, especially the organs of the abdomen, which are not accessible to observation. The vasomotor control is unstable. The basal metabolic rate is very often subnormal. The blood pressure is low. The function of the gastro-intestinal tract is below par. There is always secondary anemia. This evidence points toward a disturbed physiologic and

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subnormal functioning of many parts of the body. Much of this disturbed physiologic functioning can be ascribed to incorrect use of the body and faulty posture, which crowds the abdominal viscera. It is not at all infrequent to find that correction of posture by systematic corrective exercises and rest, with corrective positions, remedies many of the functional physiologic failures that I have mentioned. Therefore, from the very beginning of the treatment of arthritis the orthopedic surgeon, by correction of posture, can very materially aid the medical man in his fight to stop the disease. The correction of posture can be best started by rest positions in bed, where the treatment of every case of arthritis should begin. Regular positions of hyperextension, with the pillow under the shoulders, with the hands under the head, will expand the chest, widen the costal angle and raise the diaphragm. This raises all the organs of the abdomen, and the normal pump action of the diaphragm gives better circulation throughout all parts of the abdomen and extremities. A three weeks trial of this position for one-half hour three times a day is adequate to convince one of the truth of this statement.

Another position of circulatory importance is the face prone position, which is simply lying face down over a pillow. It changes radically the position of all the abdominal organs and thus relieves pressure and pull when the patient is on his back in bed. Combined with this corrective work, physical therapy is of immense importance in the stimulation of circulation of the joints by the use of general body exercise. This consists of breathing, abdominal exercise, rib stretching and the use of the trunk. General massage also stimulates circulation in the extremities, but one must be careful about touching joints that are inflamed.

While the patient is in bed, heat can be used with great benefit. It promotes better body temperature. Hot air bakes, steam baths and hot packs to the abdomen and back are often used. Local circulation is improved by packs, bakings, diathermy, infra-red radiation and sunlamps. These relieve pain and promote rest, relaxation and circulation. Fatigue must be avoided. Later good use of the body can be maintained during the convalescence while the patient is unable to stand or sit correctly, by the temporary use of supports. These are corsets, braces or even jackets. It is not necessary to go into details here. This can be found in the literature. Suffice it to say here that correction of body mechanics is being found of increasing value in the treatment of arthritis as developing a background for the restoration of normal physiologic function and functional stability, on which normal chemistry and resistance to the disease and environment depend.

Resistance to environment seems to be completely lost in most arthritic patients of the rheumatoid type. Restoration of the physiologic function as well as control of the environment seems increasingly necessary for recovery.

The second way in which the orthopedic surgeon is able materially to help the arthritic patient is through prevention of deformity early in the disease. It seems as necessary to prevent deformity as to control the disease itself, because in the past it has been found that many patients who have been cured of arthritis have been unable to lead a normal life because of the deformities that have resulted. The keynote of prevention of deformity then is to anticipate what is likely to happen and to see to it that flexion, which is the characteristic deformity of all rheumatoid arthritis, does not occur. Almost every deformity in arthritis is a flexion deformity. Flexion is due to contraction of muscles. Contraction of muscles is the result of an attempt to stabilize or splint the joint during the acute, painful stage. If nature's attempt at splinting is anticipated and the joint is put at rest in light plaster splints before the muscles have been brought into play to protect it, the necessity for muscle spasm is avoided. The patient relaxes the protected joint with comfort. Rest is secured with the relief from strain and irritation. The artificial protection is given the joint before the muscles have had a chance to produce flexion deformity. It has been found that the disease itself subsides much more quickly, the patient has more comfort, requiring less analgesic medicine, and the acute stage of the disease is materially shortened. Early protection is necessary, however, to accomplish this end. Thus much time is saved, the patients are relieved of the necessity for splinting the joints themselves, and the joint deformity is far less likely to occur.

There are, however, certain dangers that must be recognized: Rheumatoid arthritis tends toward ankylosis. In order to avoid this danger the supporting plasters must never be left on a joint more than forty-eight hours. Usually by this time the joint inflammation has subsided sufficiently to allow gentle motion. The plaster is bivalved and the joint is moved a little each day, so that the danger of adhesions is overcome. The irritation of these daily exercises is minimal, as during the greater part of the time the joint is at rest. Gradually the time of exercise is lengthened while the time of rest is shortened, until finally the joint needs protection only at night. Protection at night is more important than during the day because if people are observed when they are asleep it is found that the joints are invariably flexed at this time. After the disease is quiescent the use of the joint is permitted during the day. It has been my experience that in this way not only are deformities prevented by being anticipated, and protection given in time, but more motion is secured in the joint as a result of this early rest.

It seems probable that much of the inflammation in the joint during the acute stage is aggravated by the trauma of use, and much damage is produced. In support of this theory it was found that the right hand of a right-handed person was invariably worse than the left, and vice versa. Use, therefore, during the acute stage injures the joints. Since I have been using splints and protection I have had better functional results in the final outcome than when the joint was not protected. It is a very simple thing to make plaster splints. It can be done in the hospital or at home with slight expense or trouble. The splints can be renewed whenever necessary. They are comfortable, easily adjusted and usually fool proof, but they should not be left on too long. One must constantly have in mind the possible deformities that will occur in joints, and with the first indication of inflammation in a joint, the doctor in charge should be on the lookout for trouble and forestall it. In making splints for the joints, position is important. If ankylosis is going to take place, the most usable position should be thought of and also the one of greatest relaxation for the joint in which all muscle spasm is relieved. This simply requires a little thought and imagination.

The third object in orthopedic treatment of chronic arthritis is correction of deformity and the restoration of joints to normal function as far as possible. This

may first be attempted by the same method I have described for prevention. A joint that has already begun to flex but is not too bad very often will straighten out if the plaster splint is applied, and without strain the joint is held in a rested relaxed position for a day or two. It will be found at the end of this time that the muscles have relaxed so that the joint can be straightened several degrees farther. A new plaster is then applied in the new, corrected position. Again the joint is rested. This may be repeated indefinitely as long as correction is being obtained. The plaster, however, must be bivalved and the joint allowed exercise as in the case of early prevention. In this way in all parts of the body many cases of contracted joint deformity can be corrected. It requires meticulous care and constant supervision.

The second method of correction of deformity is by corrective splints such as the Thomas caliper splint for the knees, various banjo splints for the hands, cock-up splints for the wrists and the airplane splint for the shoulder. The third method, in cases in which correction cannot be obtained by those already mentioned, is manipulation of the joints under an anesthetic. Breaking up of adhesions is often of great value. One must, however, carefully select the case and be absolutely sure that the arthritis itself is in the quiescent stage, because manipulation of an active joint often results in complete ankylosis and increases this tendency to fusion. Manipulation should also be very carefully done, because there is danger of breaking the bones when the bones are much atrophied. It is not at all uncommon to obtain a traumatic fracture of the lower end of the femur as a result of manipulation of the knee, and fracture of the radius is not uncommon in manipulation of the wrist.

The fourth method of correction of deformity is by open operation. Operation on arthritic joints is not the serious matter it once was considered. Apparently arthritic joints heal easily and are no more apt to become infected than any other kind of joints, and the operation on an arthritic patient carries no more risk than on other depleted persons. It is, however, absolutely essential that in operating on an arthritic joint the disease itself should be as near a quiescent state as possible. It is, of course, sometimes necessary to operate before the quiescent stage is complete in order to prevent catastrophe, but as a rule one should wait until the disease is quiescent.

Time does not permit me to go into the technic or description of all the various operations. These can be obtained from the several articles on this subject. There are, however, a few operations that have been satisfactory in the hands of men who are accustomed to operating on arthritic patients. One of the most successful of these is the posterior capsuloplasty developed by Dr. Philip D. Wilson. When the posterior capsule is tight and contracted and has become very much thickened, manipulation is not successful. Correction is impossible without splitting the posterior capsule and stripping the lower end of the femur in back. This operation is most successful in correction of the flexed position of a knee when there is only a little subluxation and the patella is free. Synovectomies are of value in joints blocked by synovial overgrowth. Arthroplasties have been performed on the knee quite successfully in many cases. Arthroplasties on the elbows are almost invariably successful, giving a very satisfactory, useful arm. Operations on the hands so far have not been entirely satisfactory, although progress is being made in developing different forms of technic for such operations. Occasionally operations on the hips are useful, but they are apt to leave a rather unstable joint. They are, however, used in many cases to give a movable joint. Osteotomies can be used to correct adducted legs when the hip is stiff. One of the most important things to remember in the operative work on arthritic joints is that the patient should have a period of intensive training before the operation is performed. We have found at the Robert Breck Brigham Hospital that a month or two of training of the affected leg or arm in muscle exercise and control is important because motion can be begun sooner after operation as a result of such training. The patient is prepared to do the various exercises required as soon as the wound is healed, and far better results have been obtained in operative cases by this preoperative training.

Here logically is the place for physical therapy. The principles back of physical therapy in arthritis are age old. They are directed toward improvement in local and general circulation, relaxation, and the development of muscles. Good circulation produces healing, and heat in any form, dry, moist or diathermy, improves circulation, drawing blood to the part. It is the first physical agent to be thought of in arthritis. The general principle of all heat is to dilate the superficial blood vessels, to bring circulation to the inflamed joint and in this way promote healing and relieve pain, congestion and swelling. Heat has also been used in a general way in order to promote sweating and general relaxation and to raise the temperature to produce fever. Many methods have been used for this, such as the big dry baker, the mud bath and the steam bath, and, recently, diathermy to raise the temperature of the body has been tried with reported success.

The second physical agent used is massage. This stimulates the circulation in the skin and muscles and secures a fresh blood supply to unused muscles. It acts as a passive exercise and has been found to be very beneficial in the treatment of arthritis. However, the massage of swollen joints is not indicated, is apt to produce trouble and should never be done. General massage promotes better general physiologic function and better muscle tone and is very beneficial for those who, being bedridden, are unable to take any form of exercise.

Exercise is the third physical agent. As soon as a person is able to do exercises himself, active exercise is the best way to secure muscle massage and heat regulation. In exercising one should always consider the use of the joint, for overuse is detrimental to it. Exercises should be directed toward body correction first. Such corrective posture exercises as deep breathing, abdominal muscle control, rib stretching and use of the diaphragm and trunk are ideal and are permissible even in bed with patients who are unable to use their joints. Regular, systematic training in breathing and use of the diaphragm have permanent beneficial effects on the circulation and functions of the body. They have often been found of great benefit at the early stage of the disease in keeping up the tone, circulation and physiologic function of the body. Fatigue should be avoided in all cases of arthritis. Exercises should never be pushed to the point of fatigue.

I have said very little about hypertrophic arthritis, or osteo-arthritis, because it has much less serious consequence than the rheumatoid disease. It is a degenerative disease of increasing years and is the result of gradual injury of the joints. It is a reaction to trauma. When the trauma stops the changes stop, and the principle of orthopedic treatment is the rebalancing of the weight to stop the strain on the feet, knees, hips and back. Correction of the mechanical use of the body and a support for the joints involved, such as plates, knee splints, back braces, corsets and Thomas collars, which relieve the mechanical strain, are called for. The details of orthopedic treatment can be best found in orthopedic textbooks.

CONCLUSION

Arthritis is a constitutional disease. It requires all the care that can be given to control it, as it involves the joints, and deformity is a result of the disease. Orthopedic consultation should be obtained at the beginning of the disease before deformity has occurred. The attempt to correct the deformity is quite unsatisfactory, and prevention is comparatively easy in the early stages. This is secured by the use of light splints in anticipation of what is likely to happen; protecting joints during the acute stage is the quickest way to relieve pain in them. Splints should never be continued for long periods. Rest shortens the convalescence. Joints that have been deformed can be corrected in many cases by the use of supports applied serially, by various forms of apparatus that cause forced stretching, by manipulation and by surgery. However, joints are never so good after deformity has once occurred, no matter what method of correction is used, as if the deformity had never been allowed to take place. To this end the challenge to the orthopedic surgeon is to work in conjunction with the medical man from the very beginning of the arthritis and never to relax his efforts to promote normal physiologic function by correction of postural defects and to keep the joints from developing contraction deformities.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. IRONS, CECIL AND SWAIM

DR. WALTER BAUER, Boston: An accurate diagnosis is the first requisite in treating any patient with joint disease. Accurate diagnosis and classification of joint disease are much easier if one employs a simple classification such as that proposed by Allison and Ghormley, who divide joint disease into two groups: (1) etiology known and (2) etiology unknown. The arthritides discussed here fall into the unknown group. One must appreciate that these two forms, degenerative and rheumatoid arthritis, are in no way causally related even though one individual may have both diseases. Degenerative (hypertrophic) arthritis is not caused by a bacterial agent. It represents a form of joint disease in which the joint changes are degenerative in nature, resulting from the "wear and tear" of life and increasing age. Such joint changes may be present and yet cause no symptoms. Treatment is often not indicated; if so, weight reduction and the correction of faulty body mechanics are most important. One must remember that no treatment can be expected to restore the joint to normal. It can only relieve an already diseased joint. After listening to these papers, one appreciates that no standardized treatment for rheumatoid arthritis exists. There are a number of reasons for such a state of affairs: 1. It is a disease of unknown etiology. 2. The natural course of the disease without treatment is not known. 3. The disease is characterized by remissions and relapses. Remissions may last months or years. Therapy has often been given credit for such remissions, and in consequence all manners and forms of treatment for the arthritic patient exist. 4. Each arthritic patient is an individual problem and therefore should not be subjected to a standardized form of treatment. No one has a right to speak of therapeutic results unless the conditions of study are very rigidly and adequately controlled. There is no specific treatment. Rest, both mental and physical, is most important. However, maintenance of joint motion is essential. Physical therapy is most important. I cannot subscribe to all the claims made for posture. The diet should be well balanced, adequate in respect to vitamins, calories, calcium, phosphorus and iron. There is no proof that a low carbohydrate diet is indicated or efficacious. Next in importance are removal of focal infections, orthopedic measures, foreign protein therapy, hyperpyrexia, climate, psychotherapy, drugs and vaccines. Vaccine therapy allows for frequent visits, thereby enabling one to observe the course of the disease and suggest many helpful measures.

DR. LINN J. BOYD, New York: The chronic nonspecific arthritides can be resolved into two components: first, the constitutional element; second, the releasing factors. The danger of the constitutional approach lies in an unjustified therapeutic resignation arising out of a misconception of "constitution." Paradoxically, although many syndromes now compose the heterogeneous conglomerate of chronic deforming arthropathies and though one may fully anticipate the removal of many under new names, it is possible that attention has been focused too intently on the joint manifestations. Careful study of several hundred case histories indicates clearly a prodromal stage of fleeting neuralgias, localized cyanosis, "dead fingers" and a wide range of symptomatology suggestive of the view that the joint picture is a late event in the evolution of the disease. To review the releasing factors here would be impossible and unprofitable. Although many groups of releasing factors are appreciated, they are frequently not considered in the single case: direct traumas by mechanical disturbances are continually overlooked as well as marked overweight and underweight; I have seen the combination of Perthes' disease and Köhler's disease only twice, both instances occurring in pituitary dwarfs; Beck's disease is apparently characterized by goiter and arthritis; probably other endocrine glands may play rôles, so that there is an endocrine panel in the constitution. The suggestions afforded by the joint lesions of gout, of ochronosis, are indicative of joint damage of metabolic origin. The joint phenomena of syringomyelia and tabes imply the possibility of neurotrophic phenomena in arthritis. The doctrine of focal infection was a great advance in the conception of the chronic nonspecific arthropathies and occasional cases may be encountered in which the removal of a focus is followed by prompt remission of symptoms. In my experience these cases are not common even in the so-called infectious group. I advise removal of foci with the expectation of preventing the development of some serious diseases but without much expectation of influencing the existing arthritis. In regard to vaccines, I have gradually found less and less occasion for their use, although at times they yield brilliant results. I use iodine almost as a routine procedure; I prefer ordinary tincture of iodine, giving drop doses well diluted in water, going from one to nine drops daily and then down. Several such courses are repeated.

DR. W. PAUL HOLBROOK, Tucson, Ariz.: A tremendous advance in the care of arthritic patients would occur if physicians would accept the broad constitutional, many-sided etiologic factors that Dr. Irons brought out in his paper. The disease is constitutional and must be approached not from one angle but from every possible deviation from the normal in the individual patient. There was one point in Dr. Cecil's paper that I thought warranted emphasis: the question of vaccine. It should be remembered that vaccine or any other so-called specific therapy, if it is recommended as a specific therapy, is used by the general practitioner to the exclusion of the fundamental physiologic program. If that is not true, there should be no criticism of the use of vaccine by competent investigators. The hazard exists only in ignoring the more fundamental problems of the patient's disease. So far as Dr. Swaim's paper is concerned, I simply want to emphasize the importance

of his statement, because, of the last 1,000 patients that I have seen with atrophic arthritis, 85 per cent entered the clinic with a preventable deformity.

DR. MAURICE F. LAUTMAN, Hot Springs, Ark.: The greatest step forward in the conquest of arthritis was made when the fact was established that arthritis is not primarily a disease of the joints but rather a constitutional disease that eventually affects the joints. Dr. Irons' excellent dissertation leaves but little to be added. His insistence on a broad-visioned attack on the disease makes it clear that any successful plan of treatment must include the correction of every physiologic abnormality. I believe, however, that the simultaneous employment of every measure that offers any possibility of help for these patients is infinitely more effective than temporizing first with one plan of attack and then with another. One phase of the treatment of arthritis that deserves greater emphasis in this country is the spa treatment. This does not refer to this or that fanciful constituent of the water at any particular spa but rather to the regimen at the better type watering place or health resort. Most of them are situated inland and from a climatic standpoint are ideally suited to the arthritic patient. The communities that house them are usually small and free from industry, and the clear air and restful surroundings are a tonic in themselves. The change in environment with freedom from household cares and business worries permits a degree of mental rest that is so important and yet so difficult to obtain at home. Patients coming to a health resort usually do so because of some friend who has achieved a spectacular cure, and the idea of coming to a place where they are going to get well is an excellent mental stimulus for these habitually discouraged patients. Being imbued with the idea of getting well, they enter wholeheartedly into the business of getting well, cooperating much better and following instructions to the letter. The value of hydrotherapy and physical therapy has become increasingly evident in recent years. The beneficial effect of supervised exercise, hydrotherapy and physical therapy is always enhanced by the employment of adequate periods of rest, which the spa regimen affords, and any one who treats many cases of arthritis will agree that a regimen which includes the correct application of rest, exercise, diet, hydrotherapy and physical therapy will meet most of the requirements for the successful treatment of arthritis.

DR. S. C. WOLDENBERG, New York: Sulphur therapy in the treatment of arthritis was introduced at the veterans' hospital, Bronx, New York, in February 1932. Research in Europe had established its value and it was introduced as an adjunct to a comprehensive treatment called for by the individual needs of each patient. The results obtained exceeded our most sanguine hopes. There are more than 60,000 veterans disabled by arthritis. They show a disease history averaging over ten years, some with continuous hospitalization exceeding two or three years. Of 150 patients aged from 38 to 42 years, treated with sulphur, two thirds were advanced cases; six had every joint involved. Maximum hospitalization under the sulphur therapy was 129 days. All were cases of atrophic arthritis. The colloidal sulphur (sulphur diasporal) used was in two forms: 10 mg. for intravenous medication and 20 mg. for intramuscular medication. A high temperature, inflamed joints and marked perspiration followed the intravenous injections in many acute cases. After the fifth or sixth injection the spasticity of the muscles, the effusion in the joints and the pain began gradually to disappear. We made one radical departure. Whereas 5 mg. of sulphur twice or three times a week had been the maximum known, we found it necessary to give as much as 10 mg. every day in severe cases to obtain beneficial results. The cystine in this group ranged from 6.5 to 9.8 per cent prior to treatment. Sulphur was given until a normal of from 12.5 to 13.5 per cent resulted. The sedimentation rate was inversely proportionate to the percentage of cystine. Treatments, it was found, decreased the leukocyte count when a high count was observed. I believe that it must be considered a possibility that infection, metabolic deficiency and circulatory disorders—not one, but all—are factors, although any one of them might be responsible for the break in compensation that brings on the onset of arthritis. Each case requires individual study. Sulphur therapy, despite its great value in our opinion, can be recommended only as an adjunct. That the sulphur deficiency in patients with arthritis can be remedied is confirmed by our experience. Treatment was found effective in freeing the patient from pain, removing acute symptoms and improving metabolic stability. Although clinically each case showed decided improvement, no joint changes demonstrable in a roentgenogram were apparent as a result of treatment. The results obtained warrant further study under auspices appropriately suited to this purpose.

DR. HEINRICH F. WOLF, New York: Dr. Irons succeeded admirably in stating the problem and indicating a promising approach. But when he speaks of a workable classification, the question arises just what that means. When one speaks of therapy, a classification on pathologic anatomic grounds is of no value except for prognostication. Grouping may become a dangerous procedure as, in giving treatments, one is always dealing with an individual case and not with a group. This is evident in the use of physical therapy procedures. Rheumatoid arthritis is considered of infectious origin. Suppose the foci have been removed. There still remains a rheumatoid arthritis. But while therapeutic procedures, such as heat, may have been wholly unsuccessful before the removal of the foci or may even have aggravated the condition, they may be very helpful after the removal of the foci. That means that the identical pathologic condition in the same patient reacts as two entirely different disease entities. Or let osteo-arthritis be considered. It makes all the difference whether this condition is due only to wear and tear or whether it is complicated by an infectious process. In the latter case, according to present views, there exists an osteo-arthritis combined with a rheumatoid arthritis and the classifications are topsy-turvy. I advocate a management of the acute arthritis which differs radically from that suggested by Dr. Swaim. Is rest, as he recommends, a treatment? I have pointed out in my textbook on physical therapy that the ideal treatment of acute joint conditions is the application of iced compresses. They reduce the inflammatory process, the edema, the arterial hyperemia that is harmful because of the disturbed lymph circulation. They relieve the pain immediately and greatly shorten the course of the disease. I don't know of failures. The physiologic basis for this treatment has been established by Landis, Drury and Jones, Goldsmith and Light. Their experiments explain the disastrous effect of heat applications. I advocate even massage after the very acute symptoms have subsided and no pus is present. Under massage, I understand very gentle effleurage. It instantly relieves the spasm and the pain. The remarkable relief of pain by the use of iced compresses and gentle massage permits early motion and thus aids restoration of function.

DR. WILLIAM J. KERR, San Francisco: These papers bring together the soundest information available on the subject of chronic arthritis, with especial reference to the atrophic arthritis. A good many discussions in the arthritis committee have been held during the last two or three years about bacteria, positive blood cultures and specific vaccines in chronic arthritis, and it seems to me that an opportunity has been lost to make some controlled studies. If physicians were as careful in making blood cultures of other patients who have debilitating diseases as they are in atrophic arthritis, about as many positive cultures in the blood as in that disease would be found. The profession may be going through the same experience it did many years ago in Hodgkin's disease. It has seemed to me that there are a number of methods of treatment that have a common denominator, and perhaps this should be kept more in mind when considering every new method of treatment introduced. I believe that in most every valuable method of treatment there is improvement in the circulation of the joint by local treatment at the site, or improvement in the circulation of the joint or joints through improved general circulation. I wish only to mention some of the methods by which this may be brought about. Among the general measures may be suggested climatic change. If this is considered in the proper light, I think it will be agreed that a warm climate will perhaps open the periphery a little more, and perhaps the contrasts between day and night that are experienced in the southwestern

desert regions will help to reeducate the vessels to the joints to promote better local circulation. The various methods of producing nonspecific protein shock, or the use of drugs by which a reaction is brought about, will tend to open up the periphery and improve the circulation of the joints. Perhaps many of the so-called specific vaccines react in this manner. Possibly there is a streptococcus toxin that may act like tuberculin and may have to be considered differently. Possibly vitamin C, which has a very important action on the cement substance of vessels, will be found to be beneficial. The use of sympathectomy or other measures affecting the vasomotor nerves leads to an improvement in the circulation to the joints affected. There are, of course, the various local measures of treatment, which bring about hyperemia, either passively, such as hydrotherapy, warm baths and mud baths, which tend to bring about temporary improvement in circulation, and then the use of cold packs or ice, which bring about a reactive hyperemia. The use of liniments, counterirritants, blisters and so on act by producing hyperemia locally. Then there are massage and a variety of other measures.

DR. H. M. DAVISON, Atlanta, Ga.: The last eighteen months Dr. Mason Lowance and I have been using a cabinet type of fever producer called a hyperpyrexator. This machine produces the heat by the use of the infra-red burner. The advantage is that the fever production is not caused by the introduction of any foreign substance. The temperature produced may be controlled, and the patient suffers relatively little discomfort. The treatment is safe and may be given in the doctor's office. A large percentage of the cases have been sent to us and treated in conjunction with the orthopedic surgeon or other internists. They had already been treated by different methods for periods varying from six months to fifteen years. The temperature of these patients has seldom been raised above 103.5 F. The number of treatments varied from three to thirty. We have treated 120 cases. Approximately 33 per cent of the patients have had total relief from pain and varying degrees of therapeutic functional improvement. These cases varied from one rather marked deformity to lesser degrees. The varying amount of therapeutic functional improvement in some cases has been marked. In others it has been slight, depending somewhat on the type of deformity. In addition to this 33 per cent of total relief, 40 per cent have received marked improvement. Only 3 per cent have not been improved at all, and only 8 per cent have received so little improvement that the patients themselves did not count the treatment worth while. We believe that this method of producing therapeutic fever will prove to be a valuable adjunct in the treatment of chronic arthritis.

DR. S. ADOLPHUS KNOPF, New York: Being interested mainly in tuberculosis and hardly ever seeing any cases of arthritis, I have but little to add. There is, however, one physical therapeutic means which I employ for tuberculous patients with apical lesions, which I think should also be helpful in the management of arthritic cases. I refer to diaphragmatic respiration, which, I think, justly deserves to be classified as a physical therapeutic means. When one deals with an intelligent patient, this method of breathing is not difficult to teach, but with the less intelligent it often requires a good deal of patience and time. I have described the method in my official report to the United States government on tuberculosis and in a number of other contributions. I shall be glad to send a detailed description of how to teach this method to any one who asks for it. What benefit could an arthritic patient derive from abdominal breathing? Aside from the many reports I have received from physicians who practice this method on patients or on themselves, I shall quote only the following: "It helps to relax, it quiets the heart, it lessens fatigue and increases endurance. It improves the portal circulation and thus prevents the distressing symptoms of gas accumulation in the abdomen." The method has also a distinct psychologic effect. The patient cannot practice diaphragmatic respiration without concentrating on it. In other words, he cannot think of anything else except his slow inhalations with the aid of the diaphragm and the equally slow exhalations. He forgets about his physical suffering and is even helped to fall asleep.

DR. JAMES PATTERSON, Scarsdale, N. Y.: In observing many clinics handling arthritis, I find that each one is inclined to ride a hobby, whether it is the use of serum, vaccine, postural rest or what not. The thing that is common to all of them is giving the patient rest, good physiologic hygiene, and encouragement. Dr. Irons said that the duration of this disease is fourteen years. That is quite conservative. How many practicing physicians can keep a patient who is continually uncomfortable, continually crippled, under observation and keep him encouraged for a period of two or three years? Few can. Dr. Cecil says that the patient must reduce his weight. That is good, but one must study the patient before one has him reduce too much. The loss of 25 pounds (11 Kg.) may give quite as much distress to the gastro-intestinal tract of some patients as it will give relief to others from the reduction of pressure on sore joints. In these cases a great many remissions and exacerbations occur, and sometimes the disease is self limiting. After the pain is gone, the patient still has the mental lameness and the inability to use the muscles, which has been engendered by the long continued distress, and one has to start muscle reeducation. If one does that, an astonishing increase in movement occurs. The things to keep in mind are that it is practically impossible to keep a patient with this very chronic disease under one's own hands long enough for practical benefit; physicians should arrange through the committee on arthritis for special hospitals for such cases and send them there as soon as the diagnosis is made, because prolonged rest is more needed than anything else.

DR. A. S. GORDON, Brooklyn: I would like to subscribe to the view expressed here that the so-called rheumatoid arthritis is of infectious origin and that the etiologic agent in the vast majority of cases is in all probability some form of streptococcus. Dr. Cecil has succeeded in isolating in most cases a hemolytic streptococcus. This is not my experience. I found in most cases a nonhemolytic streptococcus. It is almost an axiom in medicine that every one has or has had some form of tuberculosis and that all, or almost all, have become immunized to it. Those who have not succeeded in developing that immunity passed on long ago. Of those who remain, a certain number will develop sooner or later some active form of tuberculosis, usually some chronic form. By similar reasoning and analogy, almost all have, or have had, some form of streptococcic disease, and almost all have become immunized to it. A certain number will break down sooner or later in life with some form of chronic streptococcic disease, and I believe that chronic streptococcic disease is a definite clinical entity. Analogous to the tuberculin type of reaction, in most adults there is a common type of an intradermal reaction due to some primary streptococcic disease similar to the tuberculin test. For a few years I have been working on a large series of cases, which have included anywhere from the very first attack of arthritis following acute infection up to the type of case lasting for thirty-one years, and I have been working with toxins instead of vaccines, as Dr. Cecil has. I found in treatment that a modified toxin or a detoxified toxin was very encouraging in its results, and I have continued this treatment for quite a long time. Some patients have been under observation for as long as two years, and some of them have been discharged more than a year and they are still doing fairly well. The diet is just as important as it is in tuberculosis. The general mixed diet is important in any chronic type of infectious disease. As to the question of allergy in this infectious type of chronic arthritis, I believe there are two factors that stand out showing the importance of allergy in this disease. First, the joint manifestations in the real type of infectious arthritis usually occur one, two, three or four weeks following an acute infection, such as an acute tonsillitis. Homer Swift in his work on acute rheumatic fever refers to this fact as the secondary infection, calling the first disease the primary infection and the joint manifestations the secondary infection. The other fact that I consider very important is that the rheumatoid arthritis joint never suppurates. I think that these two facts, that it follows an acute infection and that the joint never suppurates, account for the allergic state of this disease.

MUSCULAR DYSTROPHY, MUSCULAR ATROPHY, MYASTHENIA GRAVIS AND STRABISMUS

CLINICAL AND BIOCHEMICAL STUDIES OF THE EFFECTS OF AMINO ACID THERAPY

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Following the contributions of Aran,[1] Charcot,[2] Marie and others the essential pathologic lesions responsible for the various myopathies have been diligently studied. Still these attempts have resulted in few fruitful rewards. At present, with the usual standards of diagnosis, accurate determination of the etiologic factors in most of these cases taxes the diagnostic acumen of the best trained clinicians. It seems desirable, therefore, to study the various myopathies, from a metabolic as well as from a clinical point of view, with the aim of evolving observations that may have diagnostic and prognostic applications as well as distinct therapeutic value.

The advent of amino acid therapy in the treatment of myasthenia gravis, primary muscular dystrophy and secondary muscular atrophy has opened such vast and comparatively fertile fields of scientific endeavor that it appears that the biochemical investigation of these cases should result in many interesting and important contributions, particularly as to unbalanced creatine-creatinine metabolism, morbid physiologic processes, differential diagnosis and prognosis; and so has it been.

This newer concept has already resulted in distinct important contributions, especially as regards the clinical therapeutic results in cases of myasthenia gravis and pseudohypertrophic muscular dystrophy. However, differences of opinion have arisen concerning the various metabolic relationships and therapeutic effects following amino acid therapy. Especially is this so in certain types of muscular dystrophy and that large group of cases usually referred to as muscular atrophy secondary to pathologic lesions in the central nervous system, or abolition of function of the lower motor neurons—the so-called second trophic units.

In view of these conflicts, metabolic studies were made on thirty-four patients, representing eleven distinct types of myopathies and atrophies, grouped according to their clinical diagnosis. The creatine-creatinine metabolism of each patient was studied for a period of five days before the amino acids were administered. It was also studied through three similar periods of five days each after the therapy was begun. The metabolic determinations were reviewed in the light of the diagnosis and subsequent clinical results in each case in an attempt to elucidate correlative information.

For convenience, we have classified the cases more or less on a pathologic-clinical basis, as recommended by Wechsler,[3] rather than as eponymic entities (table 1).

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CREATINE-CREATININE METABOLISM

Women and children may eliminate a certain amount of creatine which is considered physiologic, but creatine is usually not excreted in the urine of normal adult men. The creatinuria observed in any condition is somewhat dependent on the protein intake. There was no attempt to make studies of nitrogen balance in our work because the nitrogen balance is not of particular importance as regards clinical results, as long as the patients obtain sufficient protein for normal metabolism. Creatinuria has also been observed by numerous investigators in many diseases affecting the muscular system, a review of which up to 1928 may be found in Hunter's monograph.[4] It was also present in the following instances: in cases of progressive muscular dystrophy, reported by Milhorat, Techner and Thomas,[5] Milhorat,[6] Kostakow and Slauck,[7] Harris and Brand,[8] Tripoli and Beard,[9] Reinhold, Clark, Kinsley, Custer and Connell[10] and Mettel and Slocum;[11] in cases of progressive pseudohypertrophic muscular dystrophy, reported by Brand, Harris, Sandberg and Ringer,[12] Milhorat, Techner and Thomas,[5] Chanutin, Butt and Royster,[13] and Tripoli and Beard;[9] in cases of amyotrophic lateral sclerosis, reported by Milhorat, Techner

TABLE 1.—*Classification of Syndromes of Muscular Dystrophy, Muscular Atrophy, Myasthenia Gravis, and Strabismus*

Group I—Primary Myopathies
1. Primary muscular dystrophy (usually of the lower limbs)
(*a*) Progressive muscular dystrophy
(*b*) Pseudohypertrophic (Duchenne)
(*c*) Facioscapulohumeral (Landouzy-Dejerine)
(*d*) Bulbar (Hoffmann)
(*e*) Juvenile scapular (Erb-Zimmerlin)
(*f*) Infantile-hereditary (Leyden)
2. Amyotonia congenita (Oppenheim)
3. Myotonia congenita (Thomsen)
(*a*) Early life (hereditary)
(*b*) Myotonia acquisita
4. Myotonia atrophica
5. Muscle wasting from disuse
Group II—Progressive Nuclear Muscular Atrophy
1. Mainly of small muscles of the hand (Aran-Duchenne)
2. Hereditary, familial, of infancy and childhood (Werdnig-Hoffmann)
3. Subacute and chronic poliomyelitis
4. Bulbofacial of childhood (Fazio-Londe)
5. Progressive bulbar palsy (glossolabiolaryngeal, of Bouchard)
6. Chronic progressive ophthalmoplegia (von Graefe)
7. Multiple sclerosis
8. Amyotrophic lateral sclerosis (Dejerine)
9. Progressive spinomuscular atrophy
10. Friedreich's ataxia
11. Paralysis from jamaica ginger poisoning
12. Paralysis from peripheral nerve injury
13. Paresis with muscle atrophy
Group III—Myasthenia Gravis
Group IV—Strabismus

4. Hunter, Andrew: Creatine and Creatinine, New York and London, Longmans, Green & Co., 1928, pp. 218-220.
5. Milhorat, A. T.; Techner, F., and Thomas, K.: Significance of Creatine in Progressive Muscular Dystrophy and Treatment of This Disease with Glycine, Proc. Soc. Exper. Biol. & Med. **28:** 609 (Feb.) 1932.
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and Thomas,[5] and Tripoli and Beard;[9] in acute anterior poliomyelitis, in a report by Gros,[14] and in cases of myasthenia gravis, in reports by Boothby[15] and Remen.[16]

Many of these investigators have also observed an increase of the initial creatinuria after glycine therapy in the various conditions studied. The increase in creatinuria was noted to disappear in a few weeks and in many cases clinical improvement was noted. The differential diagnostic significance of the increased and decreased creatinuria has been pointed out by Milhorat,[6] Harris and Brand[8] and others. We have recently completed a study of this question as regards the value of amino acid therapy in diagnosis and prognosis, and our detailed metabolic results in thirty cases of myopathies treated with amino acids will be published elsewhere.[17]

TABLE 2.—*Creatine Excretion Before and After Amino Acid Therapy* *

Case	Age	Average Creatine Excretion Before Therapy, Gm.	Average Creatine Excretion after Therapy: First period Gm.	First period Per Cent Increase	Second Period Gm.	Second Period Per Cent Increase	Third Period Gm.	Third Period Per Cent Increase	Type of Myopathy
Group 1:									
1	37	0.44	0.73	66.0	0.52	18.2	0.42	None	Progressive muscular dystrophy; objective and subjective improvement
2	26	0.29	0.43	48.3	0.34	17.3	0.27	None	"Psy. Inf. complex"; objective and subjective improvement
3	8	0.29	0.91	213.8	0.51	75.8	0.51	75.8	Pseudohypertrophic muscular dystrophy; objective and subjective improvement
4	10	0.28	0.55	96.4	0.30	None	0.29	None	Pseudohypertrophic muscular dystrophy; objective and subjective improvement
5	34	0.92	1.48	60.9	2.11	129.3	1.14	23.9	Progressive muscular dystrophy; objective and subjective improvement
6	12	0.43	0.96	123.3	1.42	230.2	0.87	102.3	Pseudohypertrophic muscular dystrophy; objective and subjective improvement
7	12	0.31	1.02	229.0	1.00	226.0	1.02†	229.0	Progressive muscular dystrophy; objective and subjective improvement
8	10	0.24	0.22	None	0.10	None	0.33	37.5	Pseudohypertrophic muscular dystrophy; objective and subjective improvement
9	11	0.23	0.42	82.7	0.19	None	0.30	30.4	Early spinomuscular atrophy; progress of disease arrested
10	28	1.63	0.96	None	0.51	None	0.63	None	Strabismus with ciliary muscular weakness; objective and subjective improvement
Group 2:									
11	27	0.73	1.67	128.7	1.09	49.3	0.38	None	Amyotrophic lateral sclerosis; subjective improvement
12	22	0.64	0.93	45.3	0.17	None	0.18	None	Amyotrophic lateral sclerosis; subjective improvement; progress of disease arrested
13	39	0.10	0.09	None	0.18	80.0	0.08	None	Amyotrophic lateral sclerosis; subjective improvement
14	54	0.07	0.07	None	0.07	None	0.10	42.9	Amyotrophic lateral sclerosis; subjective improvement
15	12	0.68	1.63	140.0	1.08	58.8	0.22	None	Hypothyroid and pituitary; subjective improvement
16	33	0.09	0.03	None	0.07	None	0.16	66.6	Multiple sclerosis; subjective improvement
17	28	0.37	1.49	302.7	0.96	159.4	None	None	Spinomuscular dystrophy; progress of disease arrested
Group 3:									
18	52	0.40	0.94	135.0	1.47	267.5	1.31	227.5	Progressive spinomuscular atrophy; no improvement
19	50	1.19	1.64	37.8	0.91	None	1.39	16.8	Pseudohypertrophic muscular dystrophy; no improvement
20	36	1.43	0.28	None	0.42	None	0.69	None	Friedreich's ataxia; no improvement
21	11	0.38	0.32	None	0.44	15.8	0.32	None	Progressive spinomuscular atrophy; no improvement
22	55	0.93	1.23	32.2	0.16	None	0.06	None	Tabes dorsalis, muscular dystrophy; no improvement
23	21	1.26	0.80	None	0.74	None	1.20	None	Muscular atrophy following radial nerve injury; no improvement
24	16	1.28	0.68	None	0.76	None	0.78	None	Progressive pseudohypertrophic muscular dystrophy; no improvement
25	21	0.33	0.48	45.5	0.53	60.6	0.40	21.2	Probable von Recklinghausen's disease; no improvement
26	38	0.36	0.36	None	0.25	None	0.25	None	"Jake paralysis"; no improvement
27	12	0.42	0.34	None	0.30	None	0.29	None	Pseudohypertrophic muscular dystrophy; no improvement for 1 month
28	25	0.00	0.12	None	0.00	None	0.00	None	Poliomyelitis (15 years' duration); no improvement
29	24	0.37	0.27	None	0.18	None	0.20	None	Paresis (muscle atrophy); no improvement
30	7	0.15	0.14	None	0.14	None	0.12	None	Poliomyelitis (4 years' duration); no improvement
31	7	0.17	0.37	117.6	0.27	60.0	0.71	317.6	Strabismus; no improvement during the first 2 months of therapy
32	6	0.74	0.68	None	0.53	None	0.31	None	Strabismus; no improvement during the first 2 months of therapy
33	3	0.56	0.46	None	0.28	None	0.23	None	Strabismus; no improvement during the first 2 months of therapy
34	8	0.37	0.23	None	0.36	None	0.91	146.0	Strabismus; no improvement during the first 2 months of therapy

* Glutamic acid was used in cases 1, 2, 3, 5, 6, 8, 9, 11, 12, 13, 15, 16, 18, 19, 20, 22, 23, 24, 25 and 27. Glycine was used in cases 4, 7, 10, 14, 17, 21, 26, 28, 29, 30, 31, 32, 33 and 34.

† The creatine excretion of this case after eleven months of therapy was 0.63 Gm., or 103.2 per cent above that of the control period.

Following the observations of Brand, Harris, Sandberg and Ringer[12] that glycine would increase the creatine excretion in muscular dystrophy patients, and of Beard and Barnes[18] that several different amino acids

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would increase the creatine content of young rat muscle, Milhorat, Techner and Thomas [5] fed glycine to patients suffering from muscular dystrophies and were the first to observe its definite therapeutic effects. These important results have stimulated many clinicians to use glycine, with and without ephedrine, in the treatment of various types of myopathies. Cases of myasthenia gravis [19] and pseudohypertrophic muscular dystrophy [20] have shown the most remarkable recovery. However, while some of the muscular dystrophies have been greatly benefited, no objective improvement has been observed in a few far advanced cases of this type and in the neuromuscular atrophies. In several of the two latter conditions, however, the progress of the disease was apparently arrested and only subjective improvement was noted as long as glycine therapy was continued. We have reviewed the literature on the clinical results and metabolic studies of amino acid therapy in several different types of myopathies elsewhere.[9]

Table 3.—*Cases in Which Amino Acid Therapy was Given in Which Metabolic Studies Were Not Made*

Case	Age, Years	Amino Acid Daily, Gm.	Duration of Therapy, Months	Myopathy	Progress Report
35	23	Glycine 10-15	7	Myasthenia gravis	"Masklike" expression disappearing; clinical condition very much improved
36	32	Glycine 10-15	6	Myasthenia gravis with extra-ocular paresis	Definite improvement demonstrable, and loss of vertical diplopia with return to apparent normal after three months
37	6	Glycine 10-15	8	Pseudohypertrophic muscular dystrophy	Early case with practical return to normal physique and function
38	36	Glycine 10-15	11	Pseudohypertrophic muscular dystrophy	Walks without crutches or cane with ability to perform all normal movements; physique improved; characteristic posture remains
39	44	Glycine 10-15	16	Pseudohypertrophic muscular dystrophy	Progress of disease arrested, but only slight improvement owing to the absolute atrophy of majority of involved muscles
40	61	Glutamic acid 10-15	15	Amyotrophic lateral sclerosis	Bedridden at beginning, now able to walk gradually with cane; can use hands to sew for short time; more subjective than objective improvement
41	18	Glutamic acid 10-15	15	Subacute anterior poliomyelitic paralysis (right anterior tibial and medial quadriceps)	Uninvolved muscles greatly improved; no longer uses brace or crutches when walking; no change in paralyzed muscles
42	13	Glutamic acid 10-15	8	Progressive spinal muscular atrophy	Only very slight subjective improvement
43	3	Glutamic acid 10-15	9	"Friedreich's ataxia"	General improvement noted but typical clinical picture persists unchanged

METHOD OF STUDY

The creatine-creatinine metabolism of each patient was studied over a period of twenty days. The daily excretion of total creatinine, preformed creatinine and creatine in the urine were determined over a control period of five days. At the end of this time, the oral administration of from 10 to 15 Gm. of glycine or glutamic acid in water, milk or fruit juice was begun. No change was made in the adult patient's average diet, which usually contained approximately from 300 to 400 Gm. of carbohydrate, from 100 to 125 Gm. of protein and from 90 to 100 Gm. of fat. In children, a proportionately lower caloric diet, relatively higher in protein, was advised.

The effect of the ingestion of the amino acid on the excretion of the creatine bodies was studied in twenty-four hour specimens of urine for three similar periods of five days each. The total creatinine was determined by the method of Benedict and Myers,[21] and the preformed creatinine was determined by the method of Folin.[22] The daily excretion of total creatinine minus the excretion of the preformed creatinine multiplied by 1.16 is equivalent to the daily creatine output.

RESULTS

The clinical and biochemical results obtained in thirty-four cases are listed in table 2. For purposes of comparison, the cases may be classified into three groups.

Group 1 (cases 1 to 10). Cases in which the average creatine excretion rose from 50 to 200 per cent above that of the control period, provided this increased creatinuria soon disappeared in the third or subsequent period, showed both subjective and objective improvement.

Group 2 (cases 11 to 17). Certain neuromuscular cases that presented about the same degree of increase or decrease in creatinuria as those of group 1 showed only subjective improvement or merely an arrest of their symptoms.

Group 3 (cases 18 to 34). Cases in which no increased creatinuria occurred or in which the increase was less than 50 per cent above that of the control period showed no improvement. Cases 18, 25, 31 and 34 were the exceptions.

In addition to the thirty-four cases in table 2 we have made observations in nine cases in which it was not possible to make urine studies. The results are shown in table 3.

COMMENT

The criteria for improvement in the patients were based on (1) the ability of the patients to perform the usual coordinated daily routine tasks of normal individuals, (2) the strength or lifting power of certain muscles or groups of muscles, (3) the number of times the muscles were able to contract against a load before complete fatigue resulted, and (4) the length of time fatigue lasted before the recovery of the muscle was complete. Muscular contraction may be induced by electrical stimulation, but we believe that voluntary contraction of the muscle by the patient is more convenient and beneficial and the cooperation of the patient is more easily obtained.

19. Boothby,[15] Remen,[16] Schmitt, E. O. G.: Use of Glycine in the Treatment of Myasthenia Gravis, Ann. Int. Med. **7**: 948 (Feb.) 1934.
20. Milhorat;[5] Mettel and Slocum;[11] Chanutin, Butt and Royster.[13] Boshes, B.: The Myopathies, Physiotherapy Rev. **14**: 3 (March-April) 1934.
21. Benedict, S. R., and Myers, V. C.: The Determination of Creatine and Creatinine, Am. J. Physiol. **18**: 397, 1907.
22. Folin, Otto: The Determination of Creatinine and Creatine in Urine, J. Biol. Chem. **17**: 469, 1914.

Throughout this work, practically all our patients noticed a remarkable improvement in their appetites, particularly a desire to eat protein in the form of meat. As a result of their increased food intake, practically all patients increased in weight. The stimulation of increased gastric secretion and possibly gastric contraction probably accounts for the increased appetite. Smith and Cowgill [23] recently confirmed the view held by others that increased dietary nitrogen, although not affecting the amount of pepsin, definitely increases the total amount of gastric juice secreted. Consequently, even in the cases in which no objective improvement could be demonstrated, the patients noticed a distinct improvement in their general health. As a result of this feeling of improvement in general well being, the patients were easily induced to use their muscles. Of particular interest was the willingness of patients suffering from progressive muscular dystrophy to become very active, spending a greater part of the day "trying themselves out," so to speak, on various activities which were impossible before treatment was started.

Fig. 1. — Pseudohypertrophic muscular dystrophy in a white boy.

As shown in table 2, nine out of the thirteen cases of progressive muscular dystrophy and pseudohypertrophic type of muscular dystrophy showed unmistakably marked improvement. A white boy, aged 6 years, under treatment at an early stage of this condition, apparently recovered complete physiologic function and anatomic normality, and gained about 15 to 18 pounds (6.8 to 8.2 Kg.) over a period of ten months (fig. 1). His brother with a far-advanced stage of the disease has shown little or no improvement under treatment. In another instance, a Negro boy, aged 8 years, was bedridden at the time therapy was begun. After twelve months of therapy he was able to walk fourteen city blocks to school daily and to take part in all the games, not unlike any normal child (fig. 2).

However, four cases each of a far advanced type, although not showing any further progress of the disease, manifested no definite improvement of their condition. The probable reason for the negative results in these cases is that the majority of the important muscles were completely atrophied, and return to normal function was hardly possible. Milhorat [6] and Tripoli and Beard [9] have shown that the ability of the affected muscle to return to normal under this form of therapy depends on the state of the muscle fibers at the time the therapy is begun. Should pyknosis of the nuclei of the muscle fibers be present at this time the muscle fibers continue to complete degeneration and absorption. Therefore, after the therapeutic regimen has been completed either normal muscle tissue is present or completely degenerated muscle tissue is found. In a previous communication this phase of the problem together with a relatively recent theory of creatine formation is discussed in detail.[9]

We wish to make a note concerning the diet of these patients. Some workers reporting negative results in cases of pseudohypertrophic muscular dystrophy placed their patients on relatively protein-free diets while taking amino acids. All our patients took their normal amount of protein. In fact, the patients themselves desired and sometimes partook of high protein diets while taking amino acids. However, we endeavored to keep the protein intake as uniform as possible throughout the experiment. Reinhold and his co-workers [10] also noted the beneficial effects of high protein diets with glycine.

The two cases of myasthenia gravis that have come under our observation have shown considerable improvement. Owing to the patients' residence many miles away from the city, urine studies were not possible. However, their improvement was easily demonstrable, the results confirming the observations of Boothby,[15] Schmitt [19] and others. The use of ephedrine sulphate as an adjunct to amino acid therapy is of distinct value. Although these patients improved on glycine alone, we believe that the subsequent addition of ephedrine sulphate might enhance the beneficial effect of the amino acid.

Fig. 2.—Pseudohypertrophic muscular dystrophy in a Negro boy.

The majority of cases in which the muscle atrophy was secondary to nuclear or peripheral nerve degenerations did not show the same improvement as in the cases previously mentioned. However, several of these cases had subjective and others some slight objective and subjective signs of improvement. Many of the beneficial effects noted by the patient can be accounted for by the increase in appetite, gain in weight and general feeling of well being. However, betterment in function of the unaffected muscles in the region of the completely paralyzed muscles increased the functional ability of the part, and, although the paralyzed muscles were not benefited, the functional capacity of the patient as a whole was improved.

A note concerning the use of amino acid therapy during the convalescent stage of poliomyelitis might be of interest. Gros [14] in a study of seven cases reported definite creatinuria which was increased with the admin-

23. Smith, E. R. B., and Cowgill, G. R.: Proteins as Stimulants for Secretion of Pepsin, Am. J. Physiol. **105**: 697 (Sept.) 1933.

istration of amino acids. His results led him to believe that the rate of atrophy of the paralyzed muscles was far less than that of control cases, and the muscle tone was comparatively well preserved. Also, those muscles in which only temporary loss of innervation occurred returned to normal more rapidly and more completely in the treated cases than in the untreated cases.

It seems that normal muscle metabolism depends in a great part on the proper function of the motor neurons comprising the so-called second trophic unit. When the latter is destroyed, normal creatine-creatinine metabolism of the corresponding muscle apparently becomes disturbed.

We have been unable to find any reference in the literature to studies on the creatine-creatinine metabolism in patients suffering from strabismus. One of the four generally accepted theories as to the etiology of this disease is "the muscular theory of strabismus," whose advocates maintain that the squint is due to an unbalanced activity of the rectus muscles, the eyeball being pulled to the side of the overactive muscle. In view of this theory, metabolic studies were carried out in patients affected by unilateral and bilateral strabismus. Their ages were 3, 6, 7 and 8 years, respectively. The duration of the disease varied from three months to six years. These patients were taking a relatively high protein diet, the principal constituent being meat. The average daily initial creatinuria in each case was 0.56, 0.74, 0.17 and 0.37 Gm., respectively. The slight increase above the physiologic average (0.087 Gm.) in creatine excretion in two of these children may be due to the dietary regimen. After amino acid therapy (from 10 to 15 Gm. daily), there was no increase in creatine excretion in cases 32 and 33 (table 2). However, in the other two (cases 31 and 34, table 2) the creatine excretion increased from 0.17 to 0.71 Gm. and from 0.37 to 0.91 Gm., respectively.

Careful ophthalmologic measurements two months after amino acid therapy was begun showed no significant changes from those observed before treatment. More cases are being studied in order to determine whether any uniformly consistent changes in their creatine-creatinine metabolism exists and in what manner, if any, amino acids would effect the metabolism.

SUMMARY AND CONCLUSIONS

1. A series of forty-three patients suffering from the following eleven different pathologic-clinical types of myopathies was studied as regards the effects of amino acid therapy: (*a*) myasthenia gravis, (*b*) progressive muscular dystrophy, (*c*) progressive pseudohypertrophic muscular dystrophy, (*d*) muscle wasting from disuse, (*e*) progressive spinal muscular atrophy, (*f*) subacute and chronic poliomyelitis, (*g*) multiple sclerosis, (*h*) amyotrophic lateral sclerosis, (*i*) muscular paralysis from jamaica ginger poisoning, (*j*) muscular paralysis from peripheral nerve section, and (*k*) Friedreich's ataxia.

2. Creatinuria was present in each of the ten different types of cases, except in one case of chronic poliomyelitis of fifteen years' duration.

3. The cases in which the average creatinuria increased from 50 to 200 per cent above that of the control period after amino acid therapy was begun, provided this increased creatinuria disappeared in a few weeks, showed both subjective and objective improvement.

4. Cases of the progressive nuclear type which showed about the same increase and decrease of creatinuria as those in the preceding classification showed only subjective improvement or merely an arrest of the symptoms.

5. Cases in which no increased creatinuria occurred or in which the increase was less than 50 per cent above that of the control period showed no improvement.

6. In general the cases classified as primary myopathies and myasthenia gravis showed distinct clinical improvement, except in a few cases of the former type in which the stage of the disease was advanced to the point of complete muscle degeneration.

7. Cases in which no metabolic studies were made conformed clinically in general to the foregoing statements.

8. The inclusion of amino acids in the diet serves to increase the appetite and body weight in the majority of patients with muscular dystrophy and muscular atrophy.

ABSTRACT OF DISCUSSION

DR. WALTER M. BOOTHBY, Rochester, Minn.: The authors have undertaken a big task in attempting to discuss in one paper the value of glycine and of glutamic acid in myasthenia gravis, in progressive muscular dystrophy and in progressive muscular atrophy. The three diseases are entirely different: the weakness of myasthenia gravis appears to be a characteristic fatigability of the muscles due apparently to an imperfect intermediary metabolism of the muscle protoplasm without much actual degeneration of the muscle fibers; progressive muscular dystrophy is associated with very definite and quite extensive muscle degeneration, while progressive muscular atrophy is primarily due to a change in certain nerve cells of the spinal cord. In a series of forty-six cases of myasthenia gravis treated with glycine and usually also with ephedrine, all but two responded favorably; thirteen patients are working, eight greatly benefited and doing light work; fifteen are moderately improved, and three have just started treatment. Only two failed to improve on treatment and gradually grew weaker and died; two improved on treatment but later abandoned it, grew worse and died; one died before treatment could be started; one improved greatly but contracted pneumonia and died, while one committed suicide after having definitely improved. In a series of twenty-seven cases of progressive muscular dystrophy there have been deaths but, on the other hand, no improvement has occurred that can be definitely assigned to the muscles involved. However, nearly all these patients feel better and can do more because the glycine apparently decreased the fatigability of the muscles not definitely involved in the disease; therefore it seems possible that the unfavorable progress of the disease may in some instances be slowed down or even stopped by the use of glycine and glutamic acid, but sufficient time has not yet elapsed to make such a result certain. This improvement in patients with progressive muscular dystrophy seems analogous to the decrease in fatigability that I have found to occur rather frequently following the administration of glycine to patients with a type of fatigability often seen in the tired business man or housewife and which is often an accompaniment of neurasthenia or so-called chronic nervous exhaustion. A series of progressive muscular atrophy treated with glycine is too small to permit evaluation of the results. The nature of the disease almost precludes any great benefit to the palsied muscles.

DR. K. K. CHEN, Indianapolis: The authors have demonstrated the importance of creatinuria for the diagnosis and prognosis of different types of myopathies. During the last few years I have watched the development of ephedrine and glycine therapy in the treatment of myasthenia gravis. Both drugs seem to be able to bring about improvement independently, but it is interesting to note that ephedrine, unlike glycine, will not produce creatinuria. This obviously shows that the two substances do not act in the same manner. For ephedrine the explanation seems to be simpler. The action of

23. Smith, E. R. B., and Cowgill, G. R.: Proteins as Stimulants for Secretion of Pepsin, Am. J. Physiol. **105**: 697 (Sept.) 1933.

definite creatinuria which was increased with the admin-

ephedrine on the central nervous system has been well known. For example, in dogs or monkeys following cord transection, ephedrine increases the excitability of the reflexes. In myasthenia gravis, in which little is known of the etiology, the muscular atrophy probably takes place in this manner: The function of the muscle fibers is gradually impaired, which in turn accelerates further degeneration, and by such a process a vicious cycle is set up. The use of ephedrine seems to break up this vicious cycle and arrest the atrophic process by the increase of reflex excitability. With glycine, the explanation is relatively more complex. The conversion of amino acids to creatinine is well known. Whether or not glycine will stimulate the phosphagen formation is a question that requires further study. In the work of Dr. Tripoli and his associates, I notice that they also used glutamic acid, and I got the impression that they obtained equally good results. Monosodium glutamate has a meatlike taste and is widely used in China at ordinary meals as an appetizer. This salt can be easily manufactured from soy beans. If glutamic acid is confirmed to be as good as glycine, it may be a cheaper drug than glycine.

DR. HENRY A. MONAT, Dayton, Ohio: Two months ago I had a patient with very marked progressive muscular dystrophy. I read all the suggestions I could find in medical literature as to the treatment and decided to try the glycine. Then I reviewed some of the work done in Europe by Weiss on the physiology of heart muscle and the storage of glycogen and I decided to put my patient on a high carbohydrate diet and give him small doses of insulin. The man had all the symptoms elucidated in the paper. I took measurements of the muscles and found atrophy in the muscles of the thigh and the biceps. The patient could put his hands around his biceps when he came under my observation. His creatinine was very high. Under this high carbohydrate treatment with small stimulating doses of insulin (this is the seventh week of treatment) the increase in circumference around the deltoid was up to 1½ inches. In conjunction with this high carbohydrate diet and no protein at all, I gave him physical therapy. I wonder whether this is not like one of those ideas in arthritis one gets enthusiastic about. My conclusion is that an individual should be studied as to his basal metabolism and blood chemistry and be individually treated, and one should not become overenthusiastic about one certain drug or one type of treatment.

DR. C. O. CHENEY, New York: Before this section last year, Drs. Harris and Brand reported the results of investigation that had been made by them for a number of years, including the treatment of some sixty cases of muscular dystrophy. This work has been continued, and I may say that our results do not agree with those that have been obtained by the present authors. With prolonged feeding of glycine we have not, in muscular dystrophy, been able to bring about any marked improvement in this rather large number of cases, which include both children and adults. It does seem that possibly the progress of the disease may have been arrested, but that is about all we have so far been able to bring about. The conditions in myasthenia gravis are different, and our results so far agree with those of Dr. Boothby.

DR. HENRY W. WOLTMAN, Rochester, Minn.: Myasthenia gravis tends to run a fluctuating course, and progressive muscular dystrophy is usually chronic and may come to a standstill for a number of years. However, I noticed that Dr. Tripoli and his co-workers mentioned another disease which usually ends fatally, with clocklike regularity, and that is amyotrophic lateral sclerosis. I should like to ask the authors how long these patients have been under treatment.

DR. HOWARD H. BEARD, New Orleans: I have nothing to add from the clinical point of view. I am interested mostly in the creatine metabolism. There are at least three different points of view here. First, it can be said that glycine and probably glutamic acid do increase creatine formation in muscle. That is a very important thing. Second, phosphocreatine gives energy for muscle contraction. Third, from the neurologic point of view, I think it is of interest that increased creatinuria is not usually obtained from the amino acids in neuromuscular conditions. That would seem to show the importance of the neuromuscular junction, the so-called second trophic unit in creatine formation from amino acids.

DR. CARLO J. TRIPOLI, New Orleans: The dosage we have used was from 10 to 20 Gm. a day. In children we administer 10 Gm., in adults 20 Gm. daily. Drs. Harris and Brand, who presented their work before this section last year, reported little or no benefit to their patients. In view of the conflicting results of their work, as compared with that of several others, it was our object to determine whether there was any relationship between the creatine studies and the clinical improvement, since some cases do improve and others do not. We have found that far advanced cases and many of the moderately advanced cases show no improvement whatever. The early cases, particularly children, have shown the most improvement. We have attempted to elucidate the good results obtained in some cases, and the bad or indifferent results observed in others, by metabolic studies as reported in this report. The two cases of amyotrophic lateral sclerosis which were mentioned by Dr. Woltman as improved are most interesting. A few of our patients with amyotrophic lateral sclerosis also improved. However, a great deal of their improvement we believed to be subjective, with slight definite objective benefit. A high carbohydrate diet, which has been used many times before in the treatment of such conditions, tends to increase muscle tissue. The increase in weight, however, is due principally to fat deposition and only in a slight degree to actual increase in muscle tissue. The use of amino acids in all our cases, with a few exceptions, has increased appetite. Previous work has shown that amino acids do also increase the amount of gastric secretion, although actual increase in pepsin secretion could not be demonstrated. The use of phosphates in conjunction with lactic acid in the treatment of these conditions has been tried, with some improvement noted after their administration. It would be interesting to use the three methods, high carbohydrate diet, administration of phosphates and lactic acid, and amino acids with three groups of patients in order to determine their relative efficacy. A group in which all three methods are used should coincidentally be studied. Investigation of these phases of the problem is contemplated.

PROTEINS VERSUS THE CARBOHYDRATES

AN INQUIRY INTO THEIR GASTRIC DIGESTION

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Perhaps no time has been as propitious for the food faddist as this age of unrest. History records the fact that the food faddist has appeared in almost every recorded period of human history. Such methods die a natural death but sometimes not before accomplishing widespread injury and even death. The average faddist uses all the modern methods of illegitimate propaganda and modern high pressure salesmanship to sell his wares. He has not hesitated to select quotations from medical authorities, perverting them to his own end. The public, caught in cross currents of every sort of propaganda, has lent an ear, and the medical profession has generally been backward in approaching the problem, owing to the lack of information of a reliable nature which might controvert the evidence.

Not only have these reformers rehabilitated old doctrines but they have reached a position where some of them do not hesitate to prescribe for the invalid by mail regardless of the nature of the complaint. One searches in vain through the literature revealing several thousand contributions by research workers on diet and nutrition to find any real scientific work by these reformers. One of their dictums is the presumed

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incompatibility of proteins and carbohydrates, the presumption being that proteins require an acid medium for their digestion while carbohydrates require an alkaline medium. Man is an omnivorous animal. He subsists equally well on the high protein dietary of the arctics, the high carbohydrate regimen of the tropics and the most extraordinary food combinations of the temperate zones.

There is only one way to settle this problem and that is by the direct investigation of the behavior of these substances in the human stomach. Some years ago Dr. Hawk and I, together with a group of research workers, made the first complete studies of human gastric digestion in the untraumatized normal human stomach. The results of these studies were published from 1914 to 1920 in the *American Journal of Physiology* and represent a complete survey of the behavior of the normal stomach to every variety of foodstuff. In those studies it is apparent that human gastric digestion is by no means a hit or miss proposition. In more than 1,000 studies on 200 normal men we were able to show the gastric response on all varieties of foods and to correlate these so as to present in a general way the actual digestion of these substances. This was made possible by means of fractional gastric analysis, although previous studies were largely concerned with the observations of Dr. Beaumont on Alexis St. Martin and Penzoldt's classic observations on human gastric digestion.

We found that the normal human stomach is of several types, one we found to be of a relatively slow type and another of a rapid type of gastric digestion. Furthermore, the secretory response among healthy subjects could likewise be divided into groups, some showing a tendency to a low secretory output, others to a presumed normal and still others to a hypersecretory type of response.

The most significant feature in these studies is the constancy of the type of gastric function. An individual belongs to one of these groups and, barring all accidents or disease, he maintains his gastric type. In those studies which included seventy-five complete experiments in meat digestion alone in twenty-five different subjects, we found that 100 Gm. of beef required, on the average, an evacuation time of two hours and thirty-five minutes in subjects of the rapid emptying type and three hours and twenty-five minutes in subjects with slow stomachs. Furthermore, the acid figures with meat were the highest of those encountered with any of the varieties of foodstuffs.

There were 120 studies on vegetables with twenty-four studies on potatoes prepared in ten different ways. Every form of carbohydrate is to be found in that series of studies. Tables 1 and 2 illustrate the behavior of the normal human stomach to the various varieties of food in the dietary and in themselves constitute an answer to the question as to whether the human stomach is able to handle carbohydrates and proteins. A fact that has apparently escaped the proponents of the carbohydrate-alkaline theory is that no carbohydrates are ingested which are not followed by a direct acid response on the part of the stomach; in other words, the normal digestion of carbohydrates is attended by the maceration of the carbohydrate in an acid medium before it is available for further digestion in the bowel.

In our normal subjects we found that, if we increased the quantity of beef ingested from 100 to 250 Gm., the evacuation time might be increased to five hours or more. In other words, evacuation time is dependent on the articles ingested and the quantity of food. In any event, the average, normal individual has a gastric digestive time somewhere near four hours and rarely exceeding five hours during which no reasonable amount of fermentation can ensue. In 1929 Dr. Marcil and I [1] presented a paper on the gastric digestion of meat in health and in disease. In the diseased patient, as exemplified by the chronic invalid with cardiac or renal disease, blood dyscrasias and other conditions commonly encountered in medical ward service, we found the gastric digestion of meat somewhat impaired. In other words, a falling off in secretion and a slight increase in the evacuation time was, to our minds, evidence of some functional inefficiency on the part of the chronic invalid.

Food faddists point out that while the normal individual can digest practically everything within reason, and this is literally true, the same rule does not apply to the chronic invalid. For that reason in the last year I have carried out an investigation of the digestion of meat representing a protein and potatoes representing a carbohydrate in a cross section of medical invalids ordinarily encountered in medical ward service. This series of studies represents almost every variety of medical problem ordinarily encountered in a medical ward service. Gastric, cardiac, renal, hepatic, pulmonary and infectious diseases are to be found among the number. I believe that no variety of chronic illness was missed in this group. These observations were carried on at the same time on successive mornings, and the food was carefully prepared and weighed and the following technic employed. Owing to the fact that, in my experience, the chronic invalid usually reveals a digestion time for meat of about four hours, I gave my patients for the first meal 100 Gm. of hamburger steak. Aspirations were commenced two hours after the beginning of the feeding and carried on until the stomach was clearly emptying both from the appearance of the specimen and by test lavage.

On the second day a meal of 100 Gm. of hamburger steak and 100 Gm. of mashed potatoes was given to

TABLE 1.—*Highest Total Acidity for Various Articles of Diet* *

Articles of Diet (100 Gm. Portions Unless Otherwise Stated)	Number of Observations	Highest Total Acidity (Aver.) (Cc. N/10 Alkali to Neutralize 100 Cc. of Juice)
Beef and beef products	25	120.0
Lamb and lamb products	14	135.0
Veal: (A) Market	7	140.0
(B) "Bob"	7	110.0
Pork and pork products	31	120.0
Chicken	20	125.0
Turkey	2	140.0
Guinea hen	2	110.0
Fish	75	130.0
Milk:		
Cows': 400 cc.	50	100.0
75 cc.	3	45.0
Mothers': 150 cc.	5	60.0
225 cc.	2	90.0
Gelatin (fruit juice preparations)	5	70.0
Egg and egg combinations	90	80.0
Vegetables prepared in different ways	124	75.0
Fruits	68	90.0
Bread and cereals	75	80.0
Cakes	29	90.0
Pies	29	90.0
Puddings	23	90.0
Sugars and candies	28	70.0
Ice cream	7	105.0
Ices	4	65.0
Nuts (25 to 50 Gm.)	22	100.0

* From THE JOURNAL, March 9, 1929, p. 764.

1. Rehfuss, M. E., and Marcil, G. H.: The Gastric Digestion of Meat in Health and in Disease, J. A. M. A. **92**: 763 (March 9) 1929.

unit in creatine formation from amino acids,

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fifty patients. The technic was identical and the specimens were examined grossly and from the standpoint of total and free acidity. On the third day a meal of 100 Gm. of hamburger steak, 100 Gm. of mashed potatoes and 40 Gm. of fat in the form of butter was given to forty-three patients. This was the largest amount of fat which was considered advisable to use, larger amounts being unsatisfactory.

In table 3 the following points are significant: In fifty individuals given 100 Gm. of hamburger steak the average evacuation time was three hours and fifty-one minutes. This figure was somewhat similar to our previous studies on meat digestion, although in that group only 60 Gm. of meat was used while in the studies on normal individuals, 100 Gm. was administered. In this same group of fifty persons, steak and potatoes gave an average evacuation time of three hours and fifty-four minutes. There was actually three minutes' difference in the entire groups, representing the

TABLE 2.—*Evacuation Time for Various Articles of Diet* **

Articles of Diet (100 Gm. Portions Unless Otherwise Stated)	Number of Observations	Evacuation Time (Hours and Minutes) Type of Stomach: Rapid Emptying	Slow Emptying	Average
Beef and beef products	25	2.35	3.25	3.00
Lamb and lamb products	14	2.30	3.20	3.00
Veal: (a) Market	7	....	....	2.50
(b) "Bob"	7	....	....	3.20
Pork and pork products	31	2.45	3.40	3.15
Chicken	20	2.45	3.45	3.15
Turkey	2	3.00	3.45	3.30
Guinea hen	2	....	4.00	4.00
Fish	75	....	....	2.50
Milk:				
Cows': 400 cc.	50	....	....	2.30
75 cc.	3	....	....	1.15
Mothers': 150 cc.	5	....	....	1.40
225 cc.	2	....	....	2.25
Gelatin	5	....	....	2.00
Egg and egg combinations	90	2.15	3.15	2.40
Vegetables prepared in different ways	24	2.00	2.30	2.50
Fruits	68	1.35	2.20	2.00
Bread and cereals	75	....	....	2.40
Cakes	29	....	....	3.00
Pies	29	....	....	2.30
Puddings	23	....	....	2.20
Sugars and candies	28	....	....	2.05
Ice cream	7	....	....	3.15
Ices	4	....	....	2.35
Nuts: (a) 25 Gm.	18	....	....	3.00
(b) 50 Gm.	4	....	....	4.00

* From THE JOURNAL, March 9, 1929, p. 764.

difference in the average evacuation time between proteins and proteins and carbohydrates, despite the fact that 100 Gm. of carbohydrate food had been added to the dietary. With the exception of two instances in which unusual observations occurred, the data were strikingly uniform. A glance at table 3 will emphasize the actual figures obtained.

When one realizes that among these patients studied were those with nephritis, myocarditis, cholecystitis, angina pectoris, asthma, bronchiectasis and acute illnesses such as rheumatic fever and even pneumonia, one recognizes what a remarkable organ the stomach is from the standpoint of efficiency. This evidence clearly proves that any presumed incompatibility between protein and carbohydrate food, of which beef and potatoes, to my mind, were the best examples, is certainly not sustained. With the exception of one single individual in which certain other factors were apparent, there was no evidence in any of this group that the patients were unable to handle satisfactorily and in almost normal time a reasonable amount of protein and carbohydrate. The addition of fat, as is well known, causes a slight delay in evacuation. In forty-three members of this group in whom the action of 40 Gm. of fat was studied together with 100 Gm. of meat and 100 Gm. of potatoes, the average evacuation time for the entire group was found to be about four hours and two minutes.

The acid figures in these studies are, of course, based on the observations after the two hour point. In my studies on meat in the healthy individual the acid figures from the two hour point on were practically always characteristic of the individual. I purposely delayed my studies until the two hour point so as to lessen, if possible, any fatigue on the part of the patient. Nearly 1,500 tests were made on free and combined acidity. In each instance, the acid figures from the two hour point to the end of digestion were added together and the general average was obtained. From that point all the general averages were combined and divided so as to obtain a general average for the entire group.

The result of these studies was briefly as follows: In the meat group alone the average total acidity was 69.7 and the average free acidity 28. In the meat and carbohydrate group the average total acidity was 76.2 and the average free acidity 33, while in the meat, carbohydrate and fat group, forty-three subjects in all, the average total acidity was 79.1 and the average free acidity 32.4.

To workers who are accustomed to studying gastric function it must be apparent that these secretory results are strikingly similar. The figures for the meat are almost the same as those for meat and carbohydrate. One could almost explain the slight discrepancy in acidity in the slight prolongation of time that occurs. The same thing is true regarding the figures encountered in the meat, carbohydrate and fat group. It is apparent from these figures that our original conclusion of 1929 is sustained; namely that the chronic invalid usually shows lower acid figures and slight prolongation of meat digestion. There is certainly no evidence to assume that any real change in acidity has taken place in the stomach cavity.

These observations, representing a year's work in a medical service, demonstrate better than any mere words can express the absolute inaccuracy of the statement that proteins and carbohydrates are incompatible in the stomach. They show without question that the stomach, even in the diseased individual, proceeds in orderly fashion to break up the meat fibers and initiate the first stage of protein digestion in the stomach. Furthermore, a study of these specimens proves beyond any question that there is an orderly, mechanical subdivision of carbohydrates so as to facilitate intestinal digestion. With the exception of those cases in which there is an actual stenosis or marked delay in gastric evacuation due to some mechanical obstacle, I am not familiar with any group of cases that show consistently any disturbance of protein and carbohydrate digestion. Eight of my cases showed no free acidity after the ingestion of meat and six of these eight showed no free acid consistently throughout all studies, while in two there was some free acid in either the second or the third type of meal.

I prefer to restrict my remarks strictly to my investigation, which shows beyond any question that the stomach, even in most disease conditions, is able to do its work efficiently and well. One of the outstanding features of normal gastric digestion was the observation that any type of food under appropriate conditions could be satisfactorily handled by the human stomach.

The observations on the diseased person, other than those with diseased stomachs, are by no means as numerous, but at least these contributions represent a study of gastric function in chronic organic disease.

CONCLUSIONS

1. There is evidence to show that even in the diseased individuals of markedly different types there is was free hydrochloric acid 28, total acidity 69.7; for the meat group, free hydrochloric acid, 33, total acidity 76.2; for the meat and carbohydrate group, free acidity 32.4, and total acidity 79.1; for the meat, carbohydrate and fat group, figures that can be readily explained by the increased test load used in the stomach but which are strikingly similar when one considers the method of examination.

TABLE 3.—*Average Free Acid and Total Average with Meat, Meat and Carbohydrates, and Meat, Carbohydrates and Fat*

			Meat		Meat and Carbohydrates			Meat, Carbohydrates and Fat		
	Diagnosis	Initials	Time	Free Acid Average	Total Acid Average	Time	Free Acid Average	Total Acid Average	Time	Free Acid Average	Total Acid Average
1	Bronchiectasis	L. B.	4	0	60	3¾	13.7	57	4	26.6	80.3
2	Psychasthenia	L. P.	3¼	25.8	67	2½	20	46	3¼	0	24
3	Nephritis, hypertension	F. P.	3½	41	60.6	3¼	79	109.5	4¾	4	23
4	Cholecystitis	R. K.	2¾	26	106	3½	36	68.5	2¾	0	19
5	Myocarditis, nephritis	H. N.	2¾	0	29.3	2¾	0	27	4½	18.1	53.7
6	Cholelithiasis	M. L.	3½	41.1	121	3	40.5	107	3½	34.8	120
7	Peptic ulcer	P. H.	3½	32.6	105.4	4¼	26	70.4	3¼	21.4	80.1
8	Angina pectoris	S. S.	4	30.4	51.6	3½	47.3	89	3½	59.5	95.8
9	Hysteria	M. B.	5¾	26.6	83.6	4¼	28.7	116.4	3	16.7	55
10	Cholecystitis	S. M.	3½	53.2	94.1	3	10.6	98.3	3½	39.6	71
11	Duodenal ulcer	J. A.	3	22.2	45	3¼	46.2	71.8	4	68.3	111.9
12	Tuberculosis, peritonitis	C. S.	3¼	0	30.7	3	22	65			
13	Colitis	F. C.	3¾	45.9	88	4¾	43.7	91.8			
14	Gastric neurosis	J. K.	3½	63	97.6	3½	22.1	78.5	4¼	28.6	85
15	Carcinoma, sigmoid	F. N.	3 ?	56.3	83.6	3½	85.5	121	4¾	1.3	91
16	Leukemia, lymphatic	W. G.	4¾	37.8	89.8	2½	51.1	114	4¼	25.2	115.5
17	Gastritis	J. S.	3½?	13.1	57.5	3½	16	43.6	3¾	37	67.4
18	Raynaud's disease	J. McG.	3½	29.1	50.5	3¼	40.1	89.4	4¼	50.3	76.1
19	Asthma, bronchial	S. L.	2¾	40.6	62	2¾	48.3	73	3	57	86.2
20	Kidneys, polycystic	J. C.	4	31.5	101.5	4¾	45.9	103	4½	18.5	139
21	Cholecystitis	J. H.	4	24.8	125	3¾	20.3	102.8	4¼	33.3	57.7
22	Asthma, bronchial	M. K.	3	0	27.4	3¾	0	28			
23	Peptic ulcer	R. W.	4	52.6	112.1	5	68.6	125.8	4	76.3	125
24	Tonsillitis	J. L.	4¾	0	17	5	0	17			
25	Sinusitis, asthma	M. C.	4¼	73.5	143.1	5	53.5	103.6	4¾	56.5	104.1
26	Leukemia, chronic myelogenous	L. H.	4	48.8	74.3	4½	60.5	88.5	5½	69.7	121.8
27	Gastric ulcer	J. G.	4	77.5	117.2	3¾	78.7	126			
28	Cholecystitis	C.	3¼	0	16	4	0	31.6	3¼	0	33
29	Sciatica	M. Z.	3¼	5	54.5	3¼	0	46	3	2.7	65
30	Asthma, bronchial	J. B.	4	17	77.3	4¼	36	110			
31	Cholecystitis	S. B.	4	48.8	127.4	5¼	54.7	101.4	5	60	90.3
32	Enterocolitis, acute	J. S.	4¾	47	84.1	4¾	43.6	75.6	3¾	49.8	79
33	Tuberculosis, pulmonary	P. L.	4¼	20.7	54.3	4½	19.7	36.7	4¼	1.4	36.4
34	Sinusitis, tracheobronchitis	E. B.	7¼	25	59	7	10	30			
35	Asthma, anthracosis	A. S.	4¾	37	78	5	24	101	4¼	5.7	73.2
36	Cholecystitis	A. R.	4½	....	....	4	73.1	108.6	4	62.7	142
37	Tracheobronchitis	I. K.	4½	0	22	4	1	28	3½	0	19.2
38	Jaundice, cholelithiasis	S. B.	4¾	33.9	85	4¾	24	112	6	38	78.4
39	Tonsillitis	M. F.	3¾	66.5	111.5	3½	82	122	4¼	95.2	137
40	Obesity	C. S.	3¼	0	22.5	3¾	12	75	5½	20	98
41	Emphysema	B.	3½	24.1	43	3¾	34.6	52.5	3¼	48.4	85.6
42	Amebic dysentery	H. G.	4	36.2	62.5	3¼	49.8	71	3¾	85.5	132.4
43	Anthracosis	J. L.	4¼	17.7	38.7	4¾	18	43.4	4¼	20	75.7
44	Arthritis	E. W.	3½	35.5	82	4¼	16.5	88.1	4¼	30.5	129
45	Psychoneurosis	W.	4	6.7	23	4	16	32.2	3¾	17.5	37
46	Auricular fibrillation, mitral disease	J. Hi.	3	48.7	99.5	2¾	43	87	3¾	40	90.3
47	Rheumatic fever	J. Ho.	3¼	21.6	46.8	3¾	48.4	117.5	4¼	36.3	61
48	Anthracosis	M. M.	4½	1.4	19.2	3¼	0.6	14.6	4¼	2.4	34.5
49	Rheumatic fever	O. O. L.	3¼	37	78.4	3¼	38.6	92	3½	36	78.8
50	Pneumonia, toxic jaundice	T. B.	3½	0	24	3½	0	21.3	3¼	0	26

Pulmonary diseases	13	Tuberculosis	2
Cardiac diseases	3	Rheumatic fever	2
Renal diseases	3	Pneumonia	1
Nervous diseases	3	Arthritis	1
Blood	2	Obesity	1
Gastric diseases	5	Raynaud's disease	1
Gallbladder and liver	8	Sciatica	1
Intestinal diseases	5		

Averages for the Entire Series
Evacuation time of meat alone, three hours fifty-one minutes
Of meat and corbohydrates, three hours fifty-four minutes
Of meat, carbohydrates and fat, four hours two minutes

General Acid Averages after Two Hours
Meat, free acid 28
Total acid 69.7
Meat and carbohydrates, free acid 33
Total acid 76.2
Meat, carbohydrates and fat, free acid 32.4
Total acid 79.1

no incompatibility between protein and carbohydrate digestion.

2. In fifty individuals suffering from various chronic diseases 100 Gm. of hamburger steak was digested in a little more than three hours and fifty-one minutes. On hundred grams of hamburger steak with 100 Gm. of mashed potatoes showed an average general evacuation time of three hours and fifty-four minutes; in forty-three of these persons a meal of 100 Gm. of hamburger steak, 100 Gm. of potatoes and 40 Gm. of butter showed a general evacuation time of four hours and two minutes.

3. The computed general acid figures from the two hour period onward in these three groups of studies

4. These studies emphasize the singular constancy of individual digestion, a point that we emphasized in our studies on normal gastric function.

5. There is no evidence either in the literature or in my investigation to lead me to believe that proteins and carbohydrates are incompatible in the stomach. The danger of such teaching based on a lack of scientific evidence is manifest, and while it may be true that many individuals overeat and are presumably better by a reduction of carbohydrates, the unqualified acceptance of such a teaching can lead to the occurrence of serious malnutrition as well as to a lighting of tuberculosis and old infections.

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ABSTRACT OF DISCUSSION

DR. J. EARL THOMAS, Philadelphia: I agree with Dr. Rehfuss as to the necessity for combating food faddists. The normal human stomach will handle almost anything and generally does best when it has an abundance and a variety of material to work on. However, I find it necessary to emphasize this point in teaching medical students, which indicates that the public is impressed with the claims of faddists and that some education is necessary. The observations of Dr. Rehfuss on the human stomach parallel in a way studies made years ago on animals by Cannon and by Pavlov. Pavlov noted that both carbohydrate and protein stimulate the secretion of gastric juice, protein more than carbohydrate, and fat least of all. In trying to reconcile these secretory studies with Pavlov's observations, I think that probably the meat acted as the chief stimulus in both the meat and the mixed diets. The increase in acid when carbohydrate was present was slight and probably accidental. The increase in acidity on addition of fat is surprising. In the observations on motility, the characteristic inhibitory effect of fat was noted. The amount of fat was small but was evidently sufficient to produce typical slight delay in emptying. Why should the well known inhibitory effect on secretion have failed to appear? Evidently the delayed emptying caused a retention of gastric secretagogues, and their prolonged action more than offset the inhibition of secretion due to the fat. The observations on the rate of emptying are particularly interesting, especially when it is noted that the stomach will empty 200 Gm. as rapidly as 100 Gm. of material. This suggests that the amount of material has less to do with the emptying time than the length of time it takes for the stomach to digest the food. From time to time I have emphasized the importance of the inhibiting effect on the stomach of fulness of the intestine. This study brings out another important factor, mentioned years ago by Cannon; namely, the condition of the food in the stomach. The extra carbohydrate apparently does not influence the emptying. It passes out when the protein is ready to pass out. How else is one to explain the fact that 200 Gm. of material is emptied as rapidly as 100?

DR. ERNEST H. GAITHER, Baltimore: Dr. Rehfuss proves by conclusive studies that definite types of gastric function are encountered in man and that in the majority of cases these types remain invariable throughout life. He strikes a withering blow at the chief claim of food faddists when he so clearly presents facts which he has definitely proved: "A fact which has apparently escaped the proponents of the carbohydrate, alkaline theory is that no carbohydrates are ingested which are not followed by a direct acid response on the part of the stomach; in other words, the normal digestion of carbohydrates is attended by the maceration of the carbohydrate in an acid medium before it is available for further digestion in the bowel." The important observation that during the normal period of digestion no reasonable amount of fermentation can occur will be of great assistance in dealing with aerophagic patients who insist that the distention and explosive eructations which they suffer are entirely dependent on fermentation, with the production of enormous quantities of gas. It is most difficult to convince these patients that they are laboring under a misapprehension; yet it has been my experience that such cases can be cured within twenty-four hours if sufficient time is devoted to emphasizing the facts proved by the author. The researches of Dr. Rehfuss are particularly dependable because of the manner in which they were conducted; that is, in the absence of operation and shock, thus revealing the condition without any manner of distortion. In proving that the acid figures after the ingestion of protein, carbohydrate and fat, separately and in combination, do not differ greatly, he furnishes facts of distinct value. Also when he conclusively proves, in researches on hospital invalids, that the stomach, even in the diseased individual, proceeds in orderly fashion to break up the meat fibers and initiate the first stage of protein digestion in the stomach that there is an orderly, mechanical subdivision in an acid medium of carbohydrates so as to facilitate intestinal digestion, he administers a crushing blow to the absurd theories of ignorant and dangerous food faddists and furnishes information of the highest therapeutic value.

DR. ANTHONY BASSLER, New York: It is interesting that there has been so much to do with this faddist idea in the last three or four years. One just can't eat carbohydrates without taking proteins, and one can't eat any protein food without taking carbohydrates, and I have found that to be about the best answer to make to these patients. This idea was started years ago and it has been disqualified a number of times, yet now it is stalking around throughout the Eastern part of the country. It is quite a problem in practice. There seem to be a lot of people who prefer going along lines of least resistance, and, as Dr. Gaither has said, commonly very intelligent ones, and even in ill health, they prefer to go to disqualified men for those reasons, and especially those who have the advertising flair and who make immediate and unethical contacts with the public. Following Dr. Bloodgood's idea, however scientific physicians may be, they nevertheless have a responsibility to the public, whether the public appreciates it or not. The American Medical Association's coming out authoritatively by accepting such a paper as this for a prominent publication is not only a matter for the medical profession's scientific interest; it is a matter for the medical profession to take in a wholesale way and use in a propagandist sense to the public at large, because they, after all, are the sick people. They are the people that we are here to help, and while they may be stupid, we must remember that medicine is many years ahead of the public and should each one of us individually from this point on, as doctors and as representatives of this organization, take definitely the stand that there is nothing to this reanimated diet ghost of many years ago.

DR. FRANK SMITHIES, Chicago: I desire to support Dr. Bassler's remarks. New York is not the only place where there are people easily fooled. Food faddism is the sort of thing taken up usually by well bred women who have lost their incomes or by individuals of so-called high intelligence out of jobs who are backed by some high-sounding organization and who address women's clubs, Kiwanis, Lions and the like. They bring before such societies all sorts of queer feeding theories or "systems," establish courses and even sell books about their particular plans. Physicians should be, I think, militant against this sort of thing through hospitals, journals which reach the public and even through newspapers. Most of the "column writers" for newspapers are people who are type hungry, never had a practice and know nothing about medicine except from reading literature. Next in importance is Dr. Rehfuss's proof that, when a stomach is fed a meal which makes it do work, the acid figures are even higher than are those which it is customary to consider those of disease. The addition of fat, undoubtedly, as Munson and Cowie showed in the first issue of the *Archives of Internal Medicine*, delays the emptying time of the stomach, possibly because of its effect on stimulation of the liver and the gallbladder. The introduction of the fat factor changes the orderly progress of gastric digestion of proteins so that digestion of fat later can be taken care of adequately when the secondary products of protein and of carbohydrate digestion have become properly developed.

DR. MARTIN E. REHFUSS, Philadelphia: I was unable to read the complete paper or quote all the statistics and the figures. My experience has been like a great many of the experiences other physicians must have had. People have come to me with the ridiculous but apparently plausible theory that the proteins and carbohydrates don't agree in the stomach, and I knew well from studies covering almost eight years that this could not be true. They came back with the statement, "Well, that may not be true regarding a normal individual, but it is true regarding a sick person." I knew no place I could go for exact information regarding the subject, and I made up my mind that the only way to get the information was to get it myself. It took me a year to get the figures, and more than a week and a half to compile them, but these figures are the figures as they actually occurred in the ward patients at the Jefferson Hospital, and there is no evidence in that group which in any way suggests that that incompatibility may occur. Dr. Thomas had several interesting things to say. He said there was very little difference regarding the extra hundred grams of carbohydrate. That surprised me; but the truth is that the carbohydrates require generally a short evacuation time. Regardless of the fact that I added carbohydrate to the hundred grams of meat, it was the hundred grams of meat that dominated the so-called evacuation point. The question came up as to why

more acid. The difference was 0.03 per cent. That is practically negligible, but it is probable that the addition of carbohydrate causes the secretory power of the meat to continue longer than it would, although there may be also an intestinal factor. I quoted today the figures I have obtained. I have the tables and figures, which I think wouldn't be interesting simply because I can say that if any one comes to a physician with the statement that there is a gross incompatibility between carbohydrate and protein in the ordinary stomach, barring those cases in which there is allergy or other reason for the incompatibility, it is a falsehood and has no basis in scientific fact.

CARCINOMA OF THE CECUM: WHAT ARE THE CHANCES FOR CURE?

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The question to which I wished to find an answer was whether a patient who has remained well for at least five years following resection of a segment of the colon because of carcinoma may be classified as cured. Considerable doubt may rightly exist as to whether or not this question is answerable. Some persons apparently are inherently susceptible to the development of malignant processes. Examples are the multiple carcinomas, each of a distinctly different type, occurring simultaneously or consecutively in the same patient. Malignant lesions of the colon, for the most part, are single (except those which apparently arise from malignant degeneration accompanying multiple polyposis). Radical removal is the most effective means of relief, and while the ultimate outcome in many cases is disastrous, encouragement in the surgical treatment of carcinoma of the large intestine is spurred on by those persons who, once victims of the disease, have remained well for a number of years following resection.

After a patient has survived resection of a segment of bowel because of carcinoma, the remaining pertinent question of prognosis arises. Although it is impossible to foretell accurately the outcome in such a case, one may get some idea regarding prognosis in other similar cases by detailed study of those patients who are alive many years following removal of a carcinoma of the colon.

When one attempts to collect data on the curability of disease by determining the length of time a patient has lived — for example, following resection of the cecum for carcinoma—it is important to keep in mind that the patient who is apparently relieved of such a malady may succumb to another disease before sufficient time has elapsed to determine whether or not the original disease may recur. In other words, the normal death rate is to be kept in mind. In reviewing the patients who have been operated on at the Mayo Clinic from 1907 to 1928 inclusive, for carcinoma of the cecum, I have been able to collect 221 cases. In seventy-six cases, palliative measures only were possible; in 145 cases, resection was performed. Of these 145 patients, sixty have lived five years or longer following resection. This represents a 51 per cent survival, for five years or more, of patients who recovered from operation [1] (tables 1 to 4). All specimens removed have been reexamined in the course of the present study and the grade of malignancy has been determined.

The three outstanding features with regard to the observations in these sixty cases are that practically all the patients had lost weight markedly, secondary anemia of varying degree was present, and a mass could be palpated in the right lower abdominal quadrant. Loss of weight and the finding of a palpable mass need no comment. Why the majority of patients suffering from carcinoma of the cecum become anemic may be a matter of conjecture. Alvarez and his co-workers [2] studied the varying degrees of anemia produced by carcinoma in different segments of the colon. They gave the opinion that absorption of products of bacteria, such as Bacillus welchii and organisms of the colon bacillus group, together with gradual loss of blood from the ulcerated lesion, account for the anemia. They further pointed out that in most instances apparently the mere presence of malignant cells does not in itself tend to produce anemia, for example, in cases of extensive carcinoma of the breast and fundus of the uterus the blood picture is usually normal, and it is not unusual following a short-circuiting operation in a case of carcinoma of the cecum for the blood picture at least to approach normal. The latter procedure, Adami has pointed out, relieves the pressure on the ulcerated portion and tends to prevent passage of bacteria into the lymphatic structures. These patients whose erythrocytes are markedly diminished in number, and the concentration of whose hemoglobin is decreased, may be thought to have a macrocytic type of anemia.

Obstruction is an additional phenomenon, a variable one, in cases of carcinoma of the cecum. When it is recalled that the content of the right half of the colon is of a liquid nature, it is easily understood why growths that occur in this segment of bowel may reach considerable size without the appearance of phenomena of obstruction, in contrast with those lesions which occur in the left half of the colon, where the content is semisolid and symptoms of obstruction are common.

Bargen [3] has observed that, in general, carcinomas of the cecum, and to some extent those which occur elsewhere in the right half of the colon, may be divided into three groups from the standpoint of symptoms: (1) those in which anemia occurs, (2) those in which dyspepsia occurs and (3) those in which a mass is discovered by the patient or by the physician although there are no symptoms referable to the right lower abdominal quadrant. The vast majority of cases fall into the first group, which has been discussed. Patients often make complaint of symptoms which may at first lead one to suspect appendicitis or disease of the upper part of the abdomen, such as cholecystitis or even peptic ulcer. Those growths which occur in, or involve, the ileocecal valve usually produce sufficient dyspeptic symptoms, from obstruction, to make the diagnosis relatively easy. The lesion in cases of the third group can be said usually to be discovered by accident.

In this series of sixty cases, the duration of symptoms varied from a few weeks to many years. Undoubtedly many of the patients antedate by wide margins the onset of the condition for which they sought relief. It is an established fact, however, that malignant growths may be present in the colon for a considerable length of time, remaining operable and not metastasizing.

From the Division of Surgery, the Mayo Clinic.

Read before the Section on Surgery, General and Abdominal, at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 15, 1934.

1. Pemberton, J. deJ., and Dixon, C. F.: Summary of the End-Results of Treatment of Malignancy of the Thyroid Gland and the Colon, Including the Rectum and Anus, Surg., Gynec. & Obst. **58**: 462-464 (Feb. 15) 1934.

2. Alvarez, W. C.; Judd, E. S.; MacCarty, W. C., and Zimmermann, A. R.: The Varying Degrees of Anemia Produced by Carcinoma in Different Parts of the Colon, Arch. Surg. **15**: 402-417 (Sept.) 1927.

3. Bargen, J. A.: Personal communication to the author.

When the lesion has as its site the pouch of the cecum, localization by roentgenographic studies is sometimes extremely difficult.

Prognosis varies with metastasis and grade of malignancy. Involvement of lymph nodes was found in fifteen of the sixty cases. The finding of involved lymph nodes justifies a guarded prognosis; however, absence of this finding does not necessarily rule out regional extension or metastasis. Obviously a lesion of low grade of malignancy justifies a better prognosis than one in which malignancy is of higher grade. The growths in the majority of the cases on which this report is based were of grade 2. Only three growths were of malignancy graded 4. It is interesting to note that one of the patients whose lesion was graded 4 was alive 22.2 years following resection, even though lymph nodes were involved.

The fact that all malignant growths of the cecum occur in relatively the same position has led to considerable speculation as to possible etiology. Wakeley and Rutherford [4] offered the suggestion that carcinoma occurring in the cecum almost invariably begins opposite the ileocecal valve, and that biochemical trauma, produced by the alkaline fluids from the ileum, may be considered to be the cause. Consideration of etiology rather unexpectedly leads the investigator once more to the question of involvement of lymphatic structures. Craig and MacCarty [5] in 1923 made a careful study of involvement of lymph nodes in many cases of carcinoma of the cecum in which resection had been performed at the Mayo Clinic. They, too, emphasized that the posterior wall of the cecum was the most common site of malignant growths. They concluded that the situation of the growth explained why, in those cases in which involvement of lymph nodes had occurred, the posterior ileocecal group of nodes was the first involved. Metastasis of a generalizing nature apparently does not occur as frequently or as rapidly from carcinoma of the cecum as it does from carcinoma occurring in the more distal segments of the large intestine. Explanation of this is wanting.

Robertson [6] and his co-workers found that if india ink was injected into the thoracic duct it passed first to the receptaculum chyli, thence downward to the lymph nodes along the left of the aorta. The significance of this cannot as yet be interpreted. One possible explanation for the better results obtained in resection of the right half of the colon because of carcinoma may be that the lymphatic structures of the right half of the colon are not so widely distributed as are those of the left half. Therefore, when the cecum is resected, and necessarily the right half of the colon with it, the lymphatic structures are in closer proximity to the bowel than they are when the left half of the colon is resected. Hence they are more thoroughly removed in the former instance.

Judging from this series of sixty cases, the discrepancy in the duration of symptoms and the variability of symptoms account to a considerable degree for the inability to make an early diagnosis in a high percentage of cases of carcinoma of the cecum. Patients of middle age with unexplained, severe, secondary anemia should bring to mind, however, the possibility of a malignant condition of the right half of the colon. These features, and a history of intestinal disorder,

TABLE 1.—*Carcinoma of the Cecum: Patients Living Fifteen Years or Longer Following Resection*

Case	Age, Years	Sex	Loss of Weight, Pounds	Duration of Symptoms	Palpable Tumor	Hemoglobin, per Cent	Anemia	Malignancy, Grade	Results: Lived, Years	Results: Living, Years
1	47	♂♀♂♂♂♂♂♂	10	6 weeks	+	38	Moderate	4	....	22.2
2	48	♂	5	4 months	+	80	.....	1	....	22.5
3	49	♀	?	5 years	+	68	Slight	2	....	22.8
4	40	♂	?	8 months	+	50	Marked	2	....	21.5
5	49	♂	20	2 months	+	39	Marked	2	....	20.2
6	55	♂	?	9 months	+	43	Marked	3	....	18.8
7	49	♀	17	8 years	+	40	Marked	2	18.6	
8	47	♀	0	5 years	+	68	Slight	2	....	19.3
9	48	♂	8	6 months	+	35	Marked	3	19.5	
10	53	♀	24	9 months	+	68	Slight	2	....	15.2

TABLE 2.—*Carcinoma of Cecum: Patients Living Ten to Fifteen Years Following Resection*

Case	Age, Years	Sex	Loss of Weight, Pounds	Duration of Symptoms	Palpable Tumor	Hemoglobin, per Cent	Anemia	Malignancy, Grade	Results: Lived, Years	Results: Living, Years
11	68	♀	36	2 months	+	45	Moderate	2	13.1	
12	32	♀	26	9 months	+	30	Marked	2	....	14.3
13	55	♂	20	1 year	+	40	Marked	3	....	13.0
14	54	♂	12	5 months	+	46	.....	1	....	11.0
15	54	♂	30	8 months	+	39	Marked	2	....	14.0
16	63	♀	20	6 weeks	+	34	Marked	3	....	14.1
17	56	♂	32	9 months	—	37	Marked	2	....	14.2
18	73	♂	28	5 months	+	63	Moderate	2	....	12.0
19	59	♂	20	1 year	—	36	Marked	2	....	13.7
20	60	♂	28	7 months	+	48	Moderate	2	....	11.0
21	53	♂	8	2 years	+	72	.....	3	....	13.8
22	43	?	?	7 years	+	75	.....	2	....	11.0
23	58	♀	41	2 years	+	53	Moderate	1	....	10.3
24	53	♂	33	2 years	+	21	Marked	2	....	10.5
25	66	♂	31	2 years	+	48	Moderate	2	....	10.6
26	53	♂	34	6 months	+	63	Moderate	2	....	9.3
27	44	♀	17	6 months	+	65	Slight	2	....	10.1

TABLE 3.—*Carcinoma of Cecum: Patients Living Five to Ten Years Following Resection*

Case	Age, Years	Sex	Loss of Weight, Pounds	Duration of Symptoms	Palpable Tumor	Hemoglobin, per Cent	Anemia	Malignancy, Grade	Results: Lived, Years	Results: Living, Years
28	50	♀	?	2 years	+	30	Marked	1	5.2	
29	40	♀	50	6 months	+	28	Marked	2	6.2	
30	43	♀	?	6 weeks	+	58	Moderate	2	9.6	
31	42	♀	9	2 months	+	48	Moderate	2	6.5	
32	58	♀	32	3 years	+	40	Moderate	2	9.5	
33	27	♂	41	8 weeks	—	67	Moderate	2	...	9.4
34	62	♂	22	1 year	—	64	Moderate	2	...	9.5
35	55	♂	15	2 years	+	73	.....	2	...	9.7
36	62	♂	11	5 months	+	61	Moderate	2	...	9.0
37	50	♂	5	3 months	+	43	Moderate	3	...	7.9
38	43	♂	16	1 year	+	60	Moderate	4	...	7.3
39	16	♀	?	15 months	—	74	.....	3	...	8.0
40	51	♂	10	12 months	+	60	Marked	3	...	6.2
41	57	♂	25	5 months	+	38	Marked	2	...	6.3
42	37	♂	26	Indefinite	—	70	Slight	1	...	7.1
43	56	♂	?	12 months	+	80	Slight	2	...	7.0
44	42	♂	11	7 years	+	73	Moderate	1	...	6.5
45	75	♀	?	18 months	+	70	Moderate	2	...	6.2
46	47	♂	18	Indefinite	+	70	Slight	2	...	5.7
47	51	♂	16	6 months	—	48	Marked	2	...	5.3
48	50	♀	21	12 months	+	73	Moderate	2	...	5.0
49	36	♀	?	6 weeks	+	81	Slight	2	...	5.7
50	52	♀	24	12 months	+	28	Marked	2	...	6.0
51	65	♀	58	2 years	+	60	Moderate	2	...	6.5
52	64	♀	5	10 months	+	53	Moderate	4	...	5.0
53	50	♀	39	12 months	+	36	Marked	2	...	5.5
54	42	♂	8	3 months	+	72	Slight	3	5.8	
55	47	♂	78	1 year	+	18	Marked	3	...	5.3
56	65	♂	?	4 years	+	71	Slight	2	...	8.0
57	40	♂	11	2 years	+	73	Slight	2	...	7.1
58	39	♂	22	1.5 years	+	76	.....	2	...	6.8
59	54	♂	12	2 years	+	78	.....	2	...	7.2
60	70	♂	2	9 months	+	79	.....	2	...	8.0

4. Wakeley, C. P. G., and Rutherford, R.: Carcinoma of the Cecum: A Discussion of Its Incidence, Diagnosis and Treatment, with a Report of Twenty-Five Personal Cases, Brit. J. Surg. **20**: 91-112 (July) 1932.

5. Craig, W. McK., and MacCarty, W. C.: Involvement of the Lymph Glands in Cancer of the Cecum, Ann. Surg. **77**: 698-710 (June) 1923.

6. Robertson, H. E.: Personal communication to the author.

justify investigation of the large intestine as a possible source of trouble.

The surgical treatment of carcinoma of the cecum consists, obviously, of radical removal. The type of resection of the right half of the colon to be selected is largely a matter of individual opinion. Some surgeons of wide experience in colonic surgery prefer to perform the operation in one stage. Others are of the opinion that resection should be anticipated by ileocolostomy, allowing an interim of from two to four weeks. In some cases, particularly if patients are of advanced years and are markedly emaciated, the operation in two stages seems clearly justified. As previously pointed out, sidetracking of the intestinal current frequently is instrumental in bringing about marked general improvement and in decreasing the anemia.

The patient with a malignant lesion of the cecum, whose general condition is good, may well be a fit subject for resection in one stage. Recently it has been our practice at the clinic to employ the operation in one stage in treatment of those patients of middle age whose loss of weight has not been marked. The accompanying anemia, unless extremely severe, usually can be remedied by blood transfusion twenty-four hours before operation.

TABLE 4.—*Carcinoma of Cecum: Involvement of Lymph Nodes*

Case	Age, Years	Sex	Malignancy, Grade	Results	
				Lived, Yrs.	Living, Yrs.
61	47	♂	4	...	22.2
62	54	♂	2	...	14.0
63	63	♀	3	...	14.1
64	60	♂	2	...	11.0
65	73	♂	3	...	12.0
66	58	♂	2	9.5	
67	55	♀	2	...	9.7
68	62	♂	2	...	9.0
69	50	♂	3	...	7.0
70	51	♂	3	...	6.2
71	57	♂	2	...	6.3
72	56	♂	2	...	7.0
73	50	♀	2	...	5.0
74	70	♂	2	...	8.0
75	65	♀	2	...	8.0

The choice of the type of anastomosis to be made between the ileum and the transverse colon, following resection of the right half of the large intestine, depends again on the individual surgeon and on his experience with the methods he advocates. Moynihan, in resections of the right half of the colon, employed for a time end-to-end anastomosis between the ileum and the transverse portion of the colon. He later chose to close both the ends of the ileum and colon and to make side-to-side anastomosis. The use of the button in anastomosis following resection of the right half of the colon has been proved to be an effective method. From the standpoint of safety, lateral anastomosis seems best because there is less danger of impairment to the vessels that supply the site of anastomosis. The end-to-side anastomosis has, however, gained favor with some. Lahey has advocated a modified Mikulicz procedure for removal of growths of the right half of the colon. His results from the use of this method are excellent.

Temporary ileostomy of the Witzel type serves as a worth while safeguard against distention from intestinal gases in any type of intraperitoneal resection of the right half of the colon.

The preparation of patients who are to undergo surgical procedures on the large intestine has lessened appreciably the mortality rate and also has made for a more uneventful convalescence. In brief, such patients are hospitalized four or five days before operation. During this period, their diet consists of 2,800 calories a day, of foods of lowest residue, principally carbohydrates, such as candy, fruit juices, custards, gelatin, rice, eggs, thin soups and broths. Seventy-two hours before operation, an intraperitoneal injection of vaccine, prepared from streptococci and organisms of the type of colon bacilli, is carried out. Although this procedure does not prohibit entirely the occurrence of peritonitis, it has lessened markedly the incidence of peritonitis.

SUMMARY

Sixty cases of carcinoma of the cecum, in which the patients have survived from five to twenty-two and two-tenths years after operation, form the basis of this report. In three cases the grade of malignancy was 4, in ten cases the grade was 3, in six cases it was 1, and in the remaining forty-one cases it was 2. In fifteen of the sixty cases, lymph nodes were involved.

ABSTRACT OF DISCUSSION

DR. JEROME M. LYNCH, New York: Dr. Dixon's paper is of particular value, since he calls attention to a little known phase of the carcinoma problem; namely, the high percentage of long term survivals or five, ten and fifteen year cures. I commend the note of optimism in his presentation, for it is essential to convince the profession that carcinoma of the cecum and, indeed, of the rest of the large bowel yields a high percentage of cures if handled with surgical boldness. I am impressed in my daily work with the attitude of hopelessness so prevalent among internists and general practitioners faced with carcinoma of the colon and intestine. They must be informed of such results as Dr. Dixon has presented and must be shown that the prognosis of cancer of the colon is very different from that of carcinoma of the esophagus. In these days of what might almost be called radiotherapeutic propaganda, it is refreshing to see what can be accomplished by plain surgery. I am not opposed to radiotherapy, but I remain unconvinced of its value in neoplasms of the colon and rectum. It is striking that little if any advance has been made in making early diagnoses in this field. There is too great a tendency to think of colon cancer in terms of pain, obstruction, constipation and diarrhea. It must be emphasized and taught that an indefinite dyspepsia, a loss of appetite and strength or an obscure anemia are much more common as the early symptoms. I feel that progress would be made if the middle aged patient with dyspepsia was first subjected to a fluoroscopic examination of the colon.

DR. J. W. THOMPSON, St. Louis: In the face of recurrence of carcinoma of the right half of the colon, the situation is not entirely hopeless. To prove this contention I want to summarize the histories of two patients in whom recurrence took place some years after the resection of the primary growth. Whether these were true recurrences or were additional, new primary lesions is debatable. Both of these patients were elderly men. One of them lived eight years before demonstrable recurrence or secondary growth was demonstrated. The other developed an additional carcinoma at some distance from the primary lesion fourteen years after resection of the first growth and in this patient there was metastatic involvement of the regional lymph nodes at the time of the primary operation. It has now been eight years since the resection of the second carcinoma of the right half of the colon in one patient and four years since the resection of the carcinoma in the second patient, which occurred slightly farther down the bowel. I want to emphasize this point because it brings out the necessity of detailed clinical follow up of these patients. They must be reexamined from time to time and this reexamination must include careful checking by guaiac test of the occult blood reaction in the stools as well as proctosigmoidoscopy and the barium enema examination including fluoroscopy and roentgenography. Reexploration of the abdomen is warranted, in selected cases, despite recurrence of malignant growths.

NEURITIS

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Neuritis is common; it is easily recognized, yet few conditions are so often inadequately diagnosed. The trouble is not that the physician does not name the pathologic condition correctly but that he is too willing to be satisfied with the mere naming and thereat cease his investigations. It seems important, therefore, to summarize at this time the status of knowledge concerning the etiology of neuritis so that the cause in each case may be more correctly understood and the treatment more appropriate. During the last fifteen years epidemics of encephalomyelitis, the advancing knowledge of dietary deficiency, and new industrial poisons have all added valuable facts to aid in the understanding of neuritis.

Many textbooks give excellent descriptions of the different types of neuritis, but the material is widely scattered under various headings. Of the monographic studies the best are probably by Ross and Bury [1] in 1893, by Harris [2] in 1926 and by Collier [3] in 1932. A thorough discussion of the literature would be interminable, and even a complete bibliography would be too long to print in this connection; so, for each category of neuritis discussed, we have given one or two selected references, often the earliest one, as the first description is usually the best.

The term "neuritis" as used in this paper is to be understood as meaning a painful, degenerative (often inflammatory) process in any part of the peripheral neuron. It seems unnecessary to introduce the word "neuronitis," as other authors [4] have unsuccessfully tried to do, because the syllable "neur" sufficiently indicates that it is the neuron that is involved. Rarely, if ever, are pathologic changes found in one part of a neuron alone; if the axon is primarily affected there is soon a change in the nerve cell, and vice versa. When the primary pathologic condition is localized at one part of the course of a nerve fiber, its position is often indicated by the symptomatology; eventually, however, the whole neuron suffers.

For example, in figure 1 an acute inflammation of the ventral horn cells at *A* gives the picture of anterior poliomyelitis with paralysis and later atrophy of the muscle (*M*); at the onset there is evanescent tenderness along the whole axon while the process is acute. Inflammation of the dorsal root ganglion (*D*) gives the contrasting picture of herpes zoster with a skin eruption and localized pain at *S*.

Chronic syphilitic inflammation, however, at *D* and R_1, causes locomotor ataxia, with intermittent pain, great loss of muscle sensibility and of skin sensibility to a less degree. Root lesions at R_1 and R_2 could be predominantly sensory or motor, but usually inflammation of the roots ("radiculitis") involves both elements to a greater or less degree (*R*). The fact that the location of the main lesion is in the root is ascertained by the segmental distribution of the peripheral symptoms. Similarly, inflammation, degeneration, tumor or trauma of a peripheral nerve (*N*) is recognized by the well known anatomic distribution of the nerve fibers making up each nerve trunk. Local injuries to terminal filaments in skin (*S*) and muscle (*M*) occur, of course, but either they are so local as to be insignificant or else they spread upward and involve the rest of the neuron, as in rabies, tetanus and rarely in local diphtheritic infection.

Thus our definition of neuritis (briefly stated) should be modified to read: "A painful,[5] degenerative process in any part of the peripheral neuron causing a functional loss, which, according to the anatomy involved, may be sensory, motor or mixed."

From the etiologic point of view the causes of pathologic changes in a peripheral neuron are so multifarious that a discussion of each would be tedious and confusing. The principal causes of neuritis have, therefore, been arranged in table 1 (the bibliography being given in table 2). This is indeed somewhat arbitrary, but the table presents the relationship as it is known at the present time. Obviously this is imperfect, because the etiologic agents in several of the categories are as yet entirely unknown.

The principal division into "general" and "local" is fundamental in that it separates out the less important group of unilateral disorders that attack one nerve locally, from the great group of systemic disorders that cause severe symptoms in several nerves, usually bilaterally and often symmetrically.

The "local" group is called relatively unimportant for two reasons. In the first place, the etiology is obvious, as in the mechanical cases in which surgical or medical therapy can be instituted by the appropriate physician; secondly, the symptoms are often trivial and transitory. Of course some cases of local paralysis may be severe and long lasting, and local infection of a nerve may be painful and dangerous. By and large, however, the groups under "general" are clinically more important and endanger life more than the "local" types, which are mainly seen in "outpatients," and in military and tropical practice.

REPORT OF CASES OF GENERALIZED POLYNEURITIS

To show how this table may be of use in diagnosis, some illustrative cases are here reported and discussed.

CASE 1.—*Acute infectious (febrile) polyneuritis.* An Italian girl, aged 17 years, single, admitted to the Neurological Service of the Boston City Hospital, Dec. 24, 1932, complained of weakness of the legs for two weeks. One month before admission she had an acute infection of the upper respiratory tract, accompanied by sore throat, epistaxis, fever, headache and nausea. The acute symptoms improved after a week, except for occasional headaches, anorexia and generalized weakness. December 14 her legs suddenly became weak and she collapsed. She was unable to walk and was carried to bed. There was a tingling sensation in the feet. Two days later she noticed stiffness of the left side of the face, inability to close the left eye, and "pins and needles" sensation in the finger tips. About this time she suffered from severe headaches and vomited; she had pain between the shoulders, tenderness of the calf and thigh muscles, insomnia and urgency of urination.

In childhood she had mealses, chickenpox, scarlatina, pneumonia and diphtheria. She never had poliomyelitis, rheumatic fever, chorea, pertussis or a venereal disease. The family history was not significant.

On physical examination, December 25, the patient was well developed and nourished; she weighed 110 pounds (50 Kg.)

From the Department of Neuropathology, Harvard Medical School, and the Neurological Unit, Boston City Hospital.

1. Ross, J., and Bury, J. S.: On Peripheral Neuritis—A Treatise, London, C. Griffin & Co., Ltd., 1893.
2. Harris, Wilfred: Neuritis and Neuralgia, New York, Oxford University Press, 1926.
3. Collier, J.: Morrison Lectures, Edinburgh M. J. **39**: 601 (Oct.), 672 (Nov.), 697 (Dec.) 1932.
4. Barker, L. F.; Cross, E. S., and Irwin, S. V.: Am. J. M. Sc. **159**: 157 (Feb.) 1920.

5. The element of pain may be extremely mild and evanescent, as in lead poisoning and infantile paralysis.

and was 5 feet 6 inches (170 cm.) tall. She was resting comfortably in bed, complaining of inability to close the left eyelid, burning of the eyes, lacrimation, pain between the shoulders, numbness of the fingers and toes, urgency of urination, tenderness of the biceps, hamstring and gastrocnemius muscles, and extreme weakness of the legs. There was complete paralysis of the left side of the face and slight weakness of the right side of the face; the face and neck were flushed. The pupils were equal and reacted to light and in accommodation. Other cranial nerves were normal. The tonsils were red and swollen and the palate and tongue were normal. The lungs were clear and resonant throughout. The heart was not enlarged; there were no cardiac murmurs; the pulse was 120 and the blood pressure 120 systolic, 82 diastolic. The abdomen was normal, except for weak musculature of the wall and absence of abdominal reflexes. Reflexes of the biceps, triceps, patellar and achilles tendons were absent bilaterally. The plantar reflexes were normal. Any manipulation of the legs that tended to stretch the sciatic nerves caused intense pain. The legs were weak, especially the left. The grip of the hands was weak. No sensory changes were present except hyperesthesia of the feet, and paresthesia of the fingers and toes.

Examination, Jan. 7, 1933, showed that the patient was well oriented, mentally clear and cooperative. There was a complete left facial paralysis and a slight flattening of the right side of the face. The neck was not stiff on anterior flexion, but this caused a sharp pain between the shoulders. The arms were weak and showed a fine tremor when held in extension. Marked weakness and impaired voluntary movements were noted in the legs, especially the right; subjectively the left leg was weaker. There was tenderness in the calf, thigh and biceps brachii muscles. Sensory examination showed tenderness of the sciatic and brachial nerves; areas of diminished sensation to touch and pain were found on the flexor surface of the arms. There was diminished vibratory sense below the knees. All tendon and abdominal reflexes were absent. Plantar responses were diminished. The pupils were regular and reacted well in accommodation and sluggishly to light. January 14 the patient was presented at a conference before Drs. Brouwer, Ayer, Crothers, Fremont-Smith, Putnam and Merritt. Dr. Cobb's examination showed a complete left facial paralysis, weakness of the right side of the face, fine tremor, incoordination and weakness of the arms, weakness of the legs, and painful sciatic nerves; there were absent reflexes of the upper extremities, abdomen and lower extremities; the Babinski sign was absent; the heel-to-shin test was poorly performed. There was no demonstrable sensory loss except loss of vibratory sense in the lower legs. In his discussion he linked up the neurotropic and dermotropic diseases, showing a definite relationship between dermatitis, myositis, neuritis, neuronitis and myelitis. It was agreed that the case was one of infectious polyneuritis, probably due to an unknown filtrable virus.

January 25, the left facial muscles showed weak movements. She still complained of headache, slight vertigo and slight muscle tenderness in the left biceps brachii and thigh muscles. Earlier in the day she had slight epistaxis, which required a nose pack.

January 28, the left facial muscles were still weak but she was able to close the left eye. She did not blink the left eye as often as the right. The legs were much stronger, and there was no drop foot.

January 30 there was slight epistaxis. February 2, paresthesia of the fingers had disappeared; she was able to walk. February 5, neurologic examination showed a slight left facial weakness, the left palpebral fissure wider than the right; all muscles of facial expression were active. The face had more expression and had lost the "ironed out" look. The biceps, triceps, patellar, achilles, and abdominal reflexes were present, equal and active; plantar reflexes were normal. There was marked muscle tenderness over the right calf and thigh and the left biceps brachii muscles. Walking brought out a slight weakness of the right leg. February 7 an accurate perimetric test confirmed the finding by rough test of a slight peripheral concentric constriction of the visual fields noted earlier. February 8, left facial weakness was still present, especially on volitional expression. There was pain with anterior flexion of the neck. The calf, thigh and left arm muscles were still painful. Knee jerks were hyperactive and equal; ankle jerks were present but decreased. She weighed 106 pounds (48 Kg.), a loss of 14 pounds (6.4 Kg.) since the onset of her illness.

TABLE 1.—*Principal Causes of Neuritis*

Neuritis					
Generalized Polyneuritis				Localized Neuritis	
Virus	Bacteriotoxic	Deficiency or Metabolism	Chemical	Mechanical	Infectious
Measles	Focal infections	Pellagra	Mercury	Pressure	Diphtheria
Smallpox	"Rheumatism"	Pernicious anemia	Lead	tumor	Tetanus
Chickenpox	Erysipelas	Sprue	Silver	edema	Streptococci
Parotitis	Scarlet fever	Beriberi	Arsenic	arthritis	Leprosy
Herpes	Rheumatic fever	"Alcoholic neuritis"	Phosphorus	fibrosis	
"Acute febrile"	Chorea	"Korsakow's psychosis"	Methyl alcohol	Trauma	
"Acute infective"	Septicemia	Pernicious vomiting	Ethyl alcohol	Saturday night paralysis	
"Landry's"	Puerperal fever	Hunger edema	Ethyl iodide	Volkmann contracture	
Poliomyelitis	Gonorrhea	Pregnancy	Trichlorethylene	Meralgia paresthesia	
Encephalomyelitis	Meningitis	Chronic colitis	Carbon tetrachloride		
Epidemic (lethargic) encephalitis	Diphtheria	Cancer with cachexia	Trinitrotoluene		
Erythro-edema	Typhoid fever	Tuberculosis with cachexia	Dinitrobenzene		
Acute rabic myelitis	Paratyphoid fever	Senility with cachexia	Triorthocresyl phosphate		
	Typhus fever	Diabetes	Aniline		
	Influenza	Myxedema	Sulphonethylmethane, barbital, etc.		
	Pneumonia	Hematoporphyrinuria	Chloral, Chlorbutanol		
	Malaria	"Recurrent polyneuritis"	Carbon monoxide		
	Relapsing fever	"Chronic progressive polyneuritis"	Carbon bisulphide		
	Serum sickness	Chronic bacillary dysentery			
	Acute enteric fever				

Laboratory Data: Urinalysis showed occasional faint traces of albumin and a few white blood cells on numerous examinations. There were no casts or red blood cells. White blood counts were: Dec. 24, 1932, 11,400; Jan. 14, 1933, 13,000; January 28, 12,700, and February 7, 8,500. The red blood counts were normal. Hemoglobin, December 24, was 85 per cent. The differential count was 77 per cent polymorphonuclears, 21 per cent small lymphocytes, and 2 per cent monocytes. Nonprotein nitrogen determinations on December 24 and 25 and on January 31 were 33, 33 and 17 mg. per hundred cubic centimeters, respectively. Fasting blood smear, January 31, was 76 mg. per hundred cubic centimeters. Blood culture showed no growth. The Kahn and Wassermann tests of the blood were negative. The spinal fluid readings are given in table 3. Roentgenograms of the skull were negative. Electrical reactions on February 4 showed a partial reaction of degeneration of the left facial nerve. An electrocardiogram on February 10 showed sinus arrhythmia and a pulse rate of 90.

At the time of discharge, February 13, the patient had only a slight weakness of the right leg. An examination two months later, in the outpatient department, revealed that she had made a complete recovery.

The diagnosis was infectious polyneuritis.

This type of case, although described by Osler [6] as early as 1892 and by Ross and Bury [1] in 1893, was

6 Osler, William: The Principles and Practice of Medicine, ed. 1, New York, D. Appleton & Co., 1892, p. 777.

not well recognized as a clinical entity until the World War. Then Patrick,[7] Kennedy[8] and Bradford[9] all observed cases of acute infectious neuritis that were severe and often fatal. Many of these cases occurred during the period when "lethargic encephalitis" was epidemic. Moreover, the more severe cases showed evidence of myelitis, such as exaggeration of the deep reflexes during convalescence and Babinski's sign. Some showed cranial nerve paralyses difficult to differentiate from those of encephalitis. The principal reason for segregating these cases into a neuritis group is that the disease begins with tenderness of the muscles and nerves, flaccid paralysis and paresthesia. If it were not that the tenderness persisted for weeks, the patients might well be thought to have infantile paralysis. In fact they do have, pathologically speaking, a certain amount of acute anterior poliomyelitis, but the axon appears to be more severely involved than the nerve

TABLE 2.—*References to Articles on Principal Causes of Neuritis*

GENERALIZED POLYNEURITIS

VIRUS:

Measles (Fox, T. C.: Lancet **1:** 771, 1887. Box, C. R., ibid. **1:** 22, 1931).
Smallpox (Henderson, G. C.: Lancet **2:** 1098, 1881).
Chickenpox (Ross, J., and Bury, J. S.: On Peripheral Neuritis—A Treatise, London, C. Griffin & Co., Ltd., 1893).
Parotitis (Feiling, A., and Viner, G.: J. Neurol. & Psychopath. **2:** 353, 1922).
Herpes (Levaditi, C., and Harvier, P.: Ann. Inst. Pasteur **34:** 911, 1920).
"Acute febrile" (Osler, William: The Principles and Practice of Medicine, ed. 1, New York, D. Appleton & Co., 1892, p. 777).
"Acute infective" (Kennedy, Foster: Arch. Neurol. & Psychiat. **2:** 621, 1919. Bradford, J. R.; Bashford, E. F., and Wilson, J. A.: Quart J. Med. **12:** 88, 1919).
"Landry's" (Taylor, E. W., and Clarke, J. E.: J. Nerv. & Ment. Dis. **27:** 177, 1900. Taylor, E. W., and McDonald, C. A.: Arch. Neurol. & Psychiat. **27:** 79, 1932. Landry, J. B. O.: Gaz. hebd. de méd., Paris, 1859, p. 472).
Poliomyelitis (Rivers, T. M.: Filtrable Viruses, Baltimore, Williams & Wilkins, 1928. Peabody, F. W.; Draper, George, and Dochez, A. R.: Monograph of Rockefeller Institute for Medical Research, No. 4, June 1, 1912).
Encephalomyelitis (Barker, L. F.; Cross, E. S., and Irwin, S. V.: Am. J. M. Sc. **159:** 157 1920. Bassoe, Peter: J. A. M. A. **74:** 1009, 1920).
Epidemic (lethargic) encephalitis (Bassoe, Peter: J. A. M. A. **74:** 1009, 1920).
Erythro-edema (Selter, O.: Arch. f. Kinderh. **37:** 468, 1903. Blackfan, K. D., and McKhann, C. F.: J. Pediat. **3:** 45, 1933. Bury, J. S.: M. Chron., Manchester **17:** 19, 1892-1893).
Acute rabic myelitis (Hurst, E. W., and Pawan, J. L.: J. Path. & Bact. **35:** 301, 1931).

BACTERIOTOXIC:

Focal infections (Mitchell, S. W., and Keen, W. W.: Circular No. 6, Surgeon-General's Office, March 10, 1864).
"Rheumatism" (Copeman, W. S. C.: The Treatment of Rheumatism in General Practice, London, 1933. Bury, J. S.: M. Chron., Manchester **17:** 19, 1892-1893).
Erysipelas (Browning, W.: Brooklyn M. & S. J. **1:** 11, 1888).
Scarlet fever (Shepard: M. Times & Gaz. **1:** 144, 1868).
Rheumatic fever (Harris, Wilfred: Neuritis and Neuralgia, New York, Oxford University Press, 1926).
Chorea (Gowers, W. R.: Brit. M. J. **1:** 636, 1881).
Septicemia (Gowers, W. R., and Taylor, J.: A Manual of the Nervous System, Philadelphia, P. Blakiston's Son & Co., 1899).
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Cancer with cachexia (Harris, Wilfred: Neuritis and Neuralgia, New York, Oxford University Press, 1926).
Tuberculosis with cachexia (Joffroy, A.: Arch. de physiol. 1879, p. 186).
Senility with cachexia (Oppenheim, H.: Berl. klin. Wchnschr. **30:** 589, 1893).
Diabetes (Woltman, H. W., and Wilder, R. M.: Arch. Int. Med. **44:** 576, 1929).
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Ethyl iodide (Blumgart, H. W.; Gilligan, D. R., and Swartz, S. H.: J. Clin. Investigation **9:** 635, 1931).
Trichlorethylene (Glaser, M. A.: J. A. M. A. **96:** 916, 1931. Oppenheim, H.: Berl. klin. Wchnschr. **53:** 25, 1916).
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Aniline (Reynolds, E. S.: M. Chron., Manchester **10:** 140, 1889).
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Carbon bisulphide (Edge, A. M.: Lancet **2:** 1167, 1889).

LOCALIZED NEURITIS

MECHANICAL:

Pressure:
tumor (Lewis, D., and Hart, D.: Ann. Surg. **92:** 961, 1930. Mackay, W.: Lancet **1:** 777, 1932).
edema (Mackay, W.: Lancet **1:** 777, 1932).
arthritis (Bury, J. S.: M. Chron., Manchester **17:** 19, 1892-1893).
fibrosis (Harris, Wilfred: Neuritis and Neuralgia, New York, Oxford University Press, 1926).
Trauma (Tinel, J.: Nerve Wounds, New York, William Wood & Co., 1917. Pollock, L. J., and Davis, L.: Peripheral Nerve Injuries, New York, Paul B. Hoeber, 1933).
Saturday night paralysis
Volkmann contracture
Meralgia paraesthetica (Stookey, Byron: J. A. M. A. **90:** 1705, 1928).

INFECTIOUS:

Diphtheria (Walshe, F. M. R.: Lancet **2:** 232, 1918).
Tetanus (Wilson, George, and Hadden, S. B.: J. A. M. A. **98:** 123, 1932).
Streptococci (Orr, D., and Rows, R. G.: Brain **36:** 271, 1914).
Leprosy (Monrad-Krohn, G. H.: Neurological Aspect of Leprosy, Christiania, D. Dybwad, 1925).

7. Patrick, H. T.: J. Nerv. & Ment. Dis. **44:** 322 (Oct.) 1916.
8. Kennedy, Foster: Infective Neuronitis, Arch. Neurol. & Psychiat. **2:** 621 (Dec.) 1919.
9. Bradford, J. R.; Bashford, E. F., and Wilson, J. A.: Quart. J. Med. **12:** 88 (Oct.) 1919.

cell, which obviously does not die but is able to survive and produce a new axon in those cases in which recovery occurs. Bradford and his co-workers even isolated a virus by using the Flexner-Noguchi method and transmitted this to monkeys. Since this work has not been adequately confirmed, one cannot say that the etiology of this disease is known. Nevertheless, the clinical picture, the epidemiology, the fact that patients with encephalitis sometimes have a similar neuritis, and the few autopsies which show acute changes in the white and gray matter of the central nervous system, are pieces of evidence which, taken together, point to the tentative classification of this disease with the known "virus diseases." Infantile poliomyelitis and epidemic (lethargic) encephalitis have already been mentioned. "Landry's paralysis" is a name frequently and loosely used; the original description probably referred to cases of this acute infectious type; most cases now diagnosed as "Landry's" are fulminating examples of ordinary infantile paralysis. On the whole, as Taylor [10] urged on many occasions, it is best to discard the term entirely.

Other known virus diseases that may painfully paralyze the peripheral neuron and hence can be said to produce neuritis are measles, smallpox, herpes zoster and parotitis. The last is rare, but occasional cases occur in which inflammation of the parotid gland, not unlike "mumps" in onset, is accompanied by a widespread polyneuritis and often iritis.

In summary, one may characterize acute infectious polyneuritis by the acute or subacute onset with fever, anorexia, fatigue and weakness. Then flaccid paralysis of the extremities appears, usually following numbness and tingling of the digits; usually there is facial weakness and occasionally complete bilateral facial paralysis and slight sphincter disturbances. There are no mental changes. Examination of the patient reveals a widespread muscle weakness, or even complete flaccid paralysis, with absence of tendon reflexes; the neck may be slightly stiff and painful on anterior flexion.

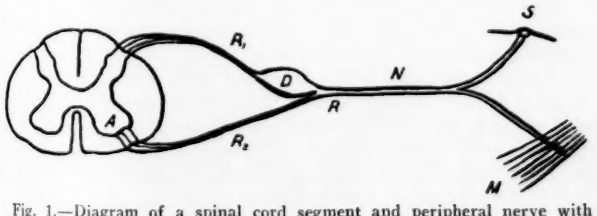

Fig. 1.—Diagram of a spinal cord segment and peripheral nerve with the sensory end-organ (*S*) and the motor endings in the muscle (*M*). The various parts of the nerve infected in neuritis are described in the text.

There is marked nerve and muscle tenderness. Sensory examination shows diminished vibratory and position sense and, occasionally, diminished cutaneous sensibility of the hands and feet. There is a slight leukocytosis, and a low fever in the beginning of the disease. The spinal fluid shows no constant changes; it may be normal and may show an excess of protein and a few leukocytes.

CASE 2.—*Bacteriotoxic polyneuritis from pansinusitis.* A white man, aged 34, a laborer, admitted to the Neurological Service of the Boston City Hospital, Dec. 15, 1931, complained of weakness and dizziness of four weeks' duration. His illness started six weeks before entry to the neurologic ward, with an acute attack of swelling and tenderness of the right cheek. He had had slight fever throughout the course of the disease. He was admitted to the aural service, Nov. 24, 1931, and the right antrum was opened and drained. He was discharged November 26. Twelve days later he noticed thickness and indistinctness of speech. This was soon followed by aching pains behind both eyes, and "pins and needles" sensation in the hands and feet. The fingers and toes became numb and cold. The legs became weak and clumsy. By December 10 the numbness of the feet had gradually ascended to the hips. He also complained of loss of weight, anorexia, constipation, gas on the stomach, difficulty in swallowing, and occasional regurgitation of food through the nostrils. The weakness of the arms and legs gradually progressed until he was confined to bed, unable to walk or care for himself. He was readmitted, December 15.

Fig. 2 (case 1).—Bilateral facial weakness more marked on the left. In *A* she was asked to raise her eyebrows and look up. In *B* she was asked to close her eyes and smile, and in trying to do this she smiled spontaneously.

The past history and family history are not remarkable.

On physical examination the patient was well developed and poorly nourished, lying in bed acutely ill. There was nasal discharge and tenderness over the right frontal sinus and antrum. The viscera and heart were normal.

On neurologic examination the cranial nerves were normal except for the fifth, eighth and ninth. The fifth showed loss of sense of pain, temperature, and touch on the right cheek. Hearing was reduced to one third on the right; the Weber test was referred to the right. The soft palate was weak, and the gag reflex was absent. The voice was thick and indistinct. In the visual fields the fundi and pupils were normal. Motor system: There was a generalized weakness in all extremities; he was unable to stand; he raised his arms feebly. There was no complete paralysis of any muscle group. The muscles of the legs showed conspicuous atrophy. Sensory system: Examination showed a hypesthesia for pain, temperature, and light touch over "glove and stocking" areas of both hands and feet. Vibratory sense was diminished in the lower extremities. Position sense was lost in the fingers and toes. There was tenderness of the muscles and nerves in the lower extremities. Reflexes: The triceps, biceps, radial, patellar and achilles tendon reflexes were absent. Abdominal and cremasteric reflexes were absent. The plantar responses were normal.

Urinalysis showed no albumin, sugar, blood cells or casts. Examination of the blood showed: hemoglobin, 85 per cent; red blood cells, 4,870,000; white blood cells, 10,700; differential count and smear, normal; blood nonprotein nitrogen, 35 mg.; the blood Kahn test, negative.

Lumbar puncture, Dec. 10, showed no abnormality. Nasal culture, Jan. 20, 1932, was positive for Streptococcus haemolyticus and Staphylococcus aureus. Blood cultures were all negative. Tests on the urine for arsenic and lead were negative. Roentgenograms showed cloudiness of the right antrum.

January 22, the patient was transferred to the aural service, where a radical sinus operation was performed on the right side. There was a normal convalescence.

February 12, the patient showed rapid improvement in the strength of the hands and arms. March 2, the patient was able to get out of bed and sit up in a chair. March 8, he was discharged home; he was able to walk with the aid of crutches. There was no weakness except that of the legs.

The social service in the follow up reported that on April 1 he began work carrying ice and has been apparently perfectly well up to July 1, 1933.

10. Taylor, E. W., and Clarke, J. E.: J. Nerv. & Ment. Dis. **27**: 177, 1900. Taylor, E. W., and McDonald, C. A.: The Syndrome of Polyneuritis with Facial Diplegia, Arch Neurol. & Psychiat. **27**: 79 (Jan.) 1932.

In this case, at first glance, it seems obvious that the polyneuritis was caused by a chronic focal infection. The time relations seem right: five and a half weeks of severe sinusitis before the neuritis. Moreover, the fact that relief followed radical drainage seems to clinch the argument. As in all complex situations, however, one must look for all the possibilities, and here it could be argued that dietary deficiency was a factor. This patient had a long illness, with anorexia, occasional vomiting, constipation and marked loss of weight; these data cannot be overlooked, and it must be admitted that lack of proper vitamin ingestion may have been important in the etiology. Perhaps more than one factor is needed to produce polyneuritis, for, if prolonged infection alone could easily produce it, the syndrome ought to be much more common than it is. In fact, the few cases we could find in the records of the neurologic service that seemed obviously related to focal infection all showed a remarkable loss in weight.

Probably local abscess formation, due to pyogenic organisms, with a subacute course is the commonest cause of the entity we are calling "bacteriotoxic polyneuritis." One subgroup would be dental abscesses, especially the apical infections with streptococci. Many cases have been seen in which dental caries was the only infection discovered, and some of these patients have improved conspicuously after tooth extraction and pus drainage. Such evidence, however, must be regarded skeptically; infected teeth are too common and polyneuritis cases are too rare to be lightly linked as cause and effect. Other factors must be sought.

TABLE 3.—*Cerebrospinal Fluid Readings*

Date	Initial Pressure	Lymphocytes	Red Blood Cells, per C.Mm.	Protein, Mg. per 100 Cc.	Sugar, Mg. per 100 Cc.	Chloride, Mg. NaCl per 100 Cc.	Colloidal Gold	Wassermann
12/24/32	130	5	42	80	91	702	0000000000	Negative
12/25/32	200	5	5	87	67	726	1120000000	Negative
1/10/33	130	3	10	80	..	...	0001111100	Negative
1/24/33	105	13	176	55	..	...	0000000000	Negative
2/ 2/33	120	3	0	28	74	732	0000000000	Negative

It is important here to mention the analogy to the clinical syndrome called "polyarthritis"; there probably is a significant relationship. A great many cases of mild polyneuritis associated with arthritis [11] are never seen by the neurologist because the internist treats the main symptoms and knows that, if he cures the joints, the nerves will probably follow suit. Involvement of the muscles frequently occurs with arthritis, but myositis is rarely diagnosed, although lame, stiff and tender muscles are one of the chief complaints. All too frequently neuritis is overlooked, even when marked muscular atrophy is present. In fact, it should be emphasized that the old fashioned term "rheumatism" (including as it should myositis, arthritis and neuritis) is a much better term than "arthritis," just because it is inclusive. Moreover, "rheumatism" is a disease treated by general practitioners, and "arthritis" tends to drift to orthopedic specialists.

The list of infections that may be associated with polyneuritis is long. In several of those listed (table 1) subacute abscess formation is probably a factor. In a number of them dietary deficiency undoubtedly plays a rôle. For example, in the days when typhoid was common and was treated by virtual starvation, a condition not unlike beriberi was a common result. Indeed, the moral to this tale is that in all chronic illness, especially when subacute and chronic focal infection plays a rôle, it is imperative not only to keep up a reasonably high caloric content in the diet but to see to it that plenty of each vitamin is being ingested.

CASE 3.—*Neuritis with alcoholic pellagra.* A man, aged 40, single, a World War veteran, admitted to the Neurological Service of the Boston City Hospital, June 20, 1933, complained of weakness, inability to walk, numbness of the feet and hands, and painful soles of the feet for one month. This illness was an acute exacerbation of a condition that he had had for the past six years. During this time he had lived a haphazard existence without doing work for self support or accepting aid from charity organizations. His food consisted of what he could get by begging or by imposing on friends. His dietary habits had been irregular. Many times he had periods of two days' starvation. A chunk of meat, bread and coffee would make up his usual noonday meal. He disliked vegetables and made no effort to get them. He occasionally ate potatoes. In spite of his difficulty to obtain proper food, he was able to get plenty of alcohol and "moonshine," and he consumed from 2 pints to 2 quarts daily with occasional respites.

A year and a half before he was in a good state of health and weighed approximately 230 pounds (104 Kg.); on admission he weighed 160 pounds (73 Kg.). He said that lack of food and appetite was responsible for the loss in weight. For the past six weeks he had had frequency of urination, numbness of the hands and feet, stiffness of the muscles and anorexia. There was an indefinite history of vomiting and diarrhea. One month before his legs were so weak that he was confined to bed.

The past history showed that he had had three admissions to the Chelsea Marine Hospital for treatment of the same syndrome. On each admission he had been discharged as cured after a stay of from four to five months. There was no history of syphilis. There had been no other significant illness.

On physical examination, June 20, the patient was well developed and emaciated; he was lying in bed, unable to walk. His face was rough and covered with a heavy growth of beard. The skin was rough and dry. There was a scaling dermititis of the hands and feet with a line of demarcation at the wrists and ankles. There was marked dental caries, a foul breath, a large tongue without atrophy or beefy color, and an injected throat. The apex beat of the heart and the left border of dulness measured 9.5 cm. from the midsternal line. There were no thrills or murmurs. The pulse was regular; the blood pressure was 120 systolic, 76 diastolic; the pulse was 80. The peripheral vessels showed no evidence of arteriosclerosis. The chest wall showed wasting. The lungs were resonant and clear. The abdominal wall was held rigid, but no abnormality was made out. The genitalia were normal. The extremities showed a pellagroid dermatitis, emaciation, weakness and soreness of the muscles, voluntary rigidity, and bilateral drop foot.

Neurologic examination showed mental confusion, fair orientation and poor memory. There was a fine unsustained horizontal nystagmus. The cranial nerves showed no other abnormalities. Motor system: There was a generalized muscular weakness and wasting; this was most marked in the small muscles of the hands, forearms and legs. There was bilateral drop foot. He was unable to walk because of weakness of the legs and soreness of the feet. There was a fine tremor of the arms. Coordinated movements of the arms and legs were poorly performed. Sensory system: There was a "glove and stocking" loss of perception of pin prick, temperature and light touch. Gentle pressure to the soles of the feet, calf muscles and thighs caused shooting pains. Pressure on or stretching of the sciatic nerve caused severe pain. Vibratory and position sense of the arms and legs were greatly diminished. Reflexes: The biceps, triceps and radials were present, active and equal. Knee jerks were present, but diminished. The achilles reflexes were absent. The abdominal, cremasteric and plantar reflexes were absent; there was no Babinski reflex. Sympathetic: The pupils reacted sluggishly

11. Copeman, W. S. C.: The Treatment of Rheumatism in General Practice, Baltimore, William Wood & Co., 1933.

to light and well in accommodation. The hands and feet were cold, dry and desquamating.

Laboratory Data: The urine was normal. Examination of the blood showed hemoglobin, 50 per cent; red blood cells, 3,850,000; white blood cells, 5,400; differential: 60 per cent polymorphonuclears, 28 per cent lymphocytes, 4 per cent monocytes, 2 per cent eosinophils and 6 per cent basophils. The smear showed achromic red cells with normal size and shape. The Kahn test was negative. Lumbar puncture showed an initial pressure of 130 mg. of water, good dynamics; it was clear with no cells; the protein was 47 mg. per hundred cubic centimeters; colloidal gold test, 0012110000; the Kahn test negative. Gastric analysis: There was no free hydrochloric acid fasting, thirty minutes following 40 cc. of 7 per cent alcohol or thirty minutes following 1 mg. of histamine subcutaneously. Combined acid was 0.3, 0.5 and 0.6 per cent, respectively.

If this patient had fabricated lies to compensate for his memory defect—in other words, if he had shown typical "confabulations"—the case would have been labeled "Korsakow's psychosis" and the pellagrous aspect of the disease might have been largely overlooked. Since this special sort of memory defect was not found (probably because he was too dull and confused to make an effort to fill in the memory gaps), the case was diagnosed "pellagrous psychosis." On such tenuous threads do differential diagnoses hang! An understanding of the pathologic process causing these two supposedly separate syndromes makes it obvious that no differential diagnosis is necessary, for they are merely slight variations of one and the same disease process. In a recent paper on alcoholic polyneuritis [12] one of us emphasizes how unsatisfactorily the pathology has been studied but shows that, when viewed from the new standpoint of deficiency disease, some order seems to rise out of the chaos. The pathologic changes of one group of alcoholic patients closely resemble those of beriberi, in which the lesions are essentially a degenerative neuritis of the long peripheral nerves. Another group, the Korsakow syndrome, has pathologic changes much like pellagra, in which nerve cell degeneration in the cerebral cortex is the conspicuous lesion. A third, less observed or rarer, has spinal cord lesions resembling those found in pernicious anemia. Scurvy, too, may result from chronic alcoholism and an analogy might be drawn between the vascular lesions of scurvy and those found in "polioencephalitis superior" due to chronic alcoholism.

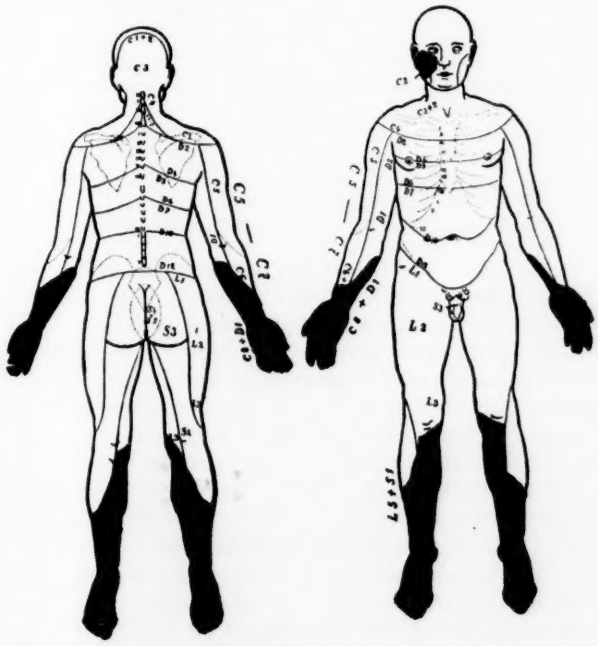

Fig. 3.—Black areas on hands and feet show location of hypesthesia for pain, temperature and light touch on Dec. 16, 1932.

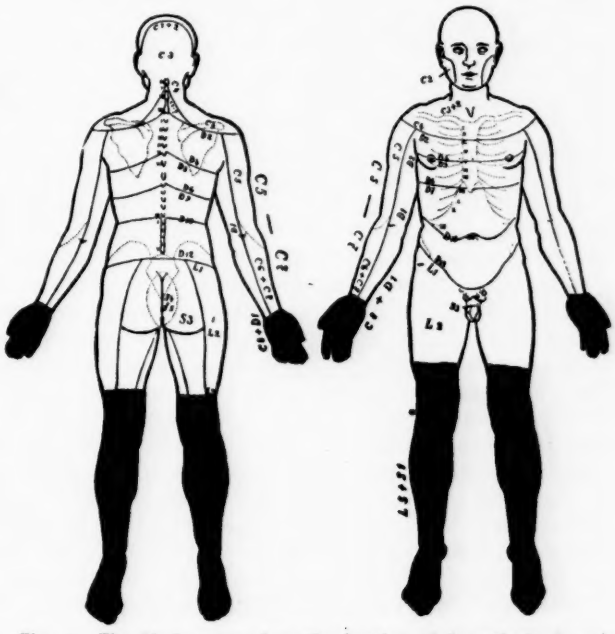

Fig. 4.—The black areas show the location of hypesthesia for pin prick, temperature and light touch on June 27, 1933. Pressure on the soles and muscles of the legs and thighs, however, causes sharp shooting pain. Vibration and position sense are absent at ankles and wrists.

Thus it is evident that the old narrow classifications must be broken down; many cases will not exactly fit the diagnosis of "pellagra," "beriberi" or "alcoholic neuritis," and cases of dietary deficiency are known to show all these lesions—cerebral, spinal and neural. Even clinically the classification is less dogmatic. For instance, "alcoholic pellagra" and "alcoholic beriberi" are becoming accepted diagnoses. It is not a question of fine differentiation of syndromes but a problem of broad understanding of the pathologic process, which is alike in all but variously localized. This localization of the process in different parts of the nervous system determines quite different symptoms. In other words, the imbibing of alcohol may, by its effect on the digestive tract and the diet, precipitate neuronal degeneration (and perhaps vascular lesions) in the brain, cord or peripheral nerves. If the process is largely in the brain and peripheral nerves, Korsakow's syndrome results. If the brain is affected severely, with less degeneration of the cord and least in the peripheral nerves, the syndrome is that of pellagra. The converse of this picture is "alcoholic" polyneuritis, while Nonne's "myelitis intrafunicularis" is intermediate between these two.

Such a classification may be too schematic, but it gives a point of departure to the clinical investigator and a chance to rearrange the facts of this group of diseases. If the cases observed in the next few years fit fairly well into this classification, the value of having had the temerity to make such a speculation on inadequate data will have been proved.

The importance of recognizing that these lesions are due to definite dietary restriction and not to alcohol per se or any vague "toxin" is of great practical importance. In the first place, patients should be immediately

12. Minot, G. R.; Strauss, M. B., and Cobb, Stanley: New England M. J. 208: 1244 (June 15) 1933.

and actively treated with concentrated vitamins, by mouth and parenterally. Secondly, state aid to the needy must be scientifically given; soup kitchens and bread lines can induce severe nervous and mental diseases if unbalanced diets are given out. The expense of giving adequate vitamins is small; the cost of feeding many people on an inadequate diet is great in future suffering and institutional care. Pellagra is not a rare disease. In large city hospitals many cases are found, especially among the aged and destitute. These old folk frequently live in rooms or attics, cook a little for themselves over a gas burner and go out occasionally for a meal. Their diet is inadequate at best. If alcohol is used to drown boredom or despair, appetite is reduced and even less is eaten. Neuritis, pellagra or subacute degeneration of the spinal cord eventually results; sometimes two or even all three of these conditions occur. Anemia and dermatitis are concomitants. Just how the blood changes, the skin lesions and the neuropathologic changes are related is not yet known; it used to be thought that "pernicious anemia" caused "combined system disease." This is now known to be untrue. Some common cause is working to start the two abnormal processes. The paresthesias of early pernicious anemia are probably due to slight neuritis; in the later stages of the disease, polyneuritis with excruciating tenderness may dominate the symptom picture. Some types of beriberi and of alcoholic neuritis are indistinguishable; in fact, one might call the latter "white man's beriberi," a disease due to the substitution of alcoholic calories for food.

CASE 4.—*Neuritis due to lead poisoning.* A white man, aged 50, admitted to the Neurological Service of the Boston City Hospital, Aug. 20, 1931, complained of weakness of the arms and legs of ten days' duration. His illness dated to four or five months before, when there was considerable gastric distress without vomiting. One month before entry he noticed that his arms and legs were weak and became easily tired. The arms became increasingly weaker until he was unable to lift ordinary objects. Finally he could not lift his knife and fork to eat, or even button his clothes and care for himself. He noticed that his hands were cold and his right shoulder was "sore." During the five months of illness he had lost 20 pounds (9 Kg.) in spite of the fact that he was on a fairly good diet.

For the past seven years he had used a moderate amount of whisky; careful questioning showed that recently it had been "home brew" distilled in an improvised apparatus, the "worm" of which was a long coil of lead pipe. On test a sample of this brew showed 2 mg. of lead per liter.

On physical examination the patient was poorly nourished and extremely emaciated; he was lying in bed and was unable to raise his arms. The abnormalities noted included peripheral arteriosclerosis, beginning bilateral opacities of the lenses, carious teeth, pyorrhea, typical lead line on the gums, emphysematous chest, palpable liver, and varicosities of the legs. The blood pressure was 130 systolic, 75 diastolic.

On neurologic examination the patient was euphoric but well oriented, with good memory and normal sensorium. The cranial nerves showed no involvement. There was a very marked generalized wasting of the muscles of the trunk and extremities. This was more noticeable in the forearms than in the arms, and more noticeable in the legs than in the thighs. It was most conspicuous in the small muscles of the hands. The muscles were very irritable and contracted in localized spasms when stimulated by tapping. The shoulder girdle and abdomen showed weakness and atrophy. Fibrillary twitchings were seen in the leg and arm muscles after exercise. There was bilateral complete wrist drop and partial foot drop. The patient walked with difficulty. He could not raise his arms to the level of the clavicles because of weakness at the shoulder and elbow. The hand grip was weak, flexion of the wrist was weak and extension of the wrist was absent. All types of sensation were normal except for diminution of vibratory sense of the right leg. The knee jerks were weak; the ankle jerks were absent; the tendon reflexes at the wrists and in the biceps of both arms were absent; the triceps jerks were weak. The abdominal reflexes were easily fatigued; the cremasteric reflexes were absent. The sympathetic system was normal except for slightly irregular pupils, which reacted sluggishly to light and in accommodation. The hands were cold and sweaty.

Urinalysis was normal except for an occasional white blood cell. Examination of the blood, September 8, showed hemoglobin, 55 per cent (Sahli); red blood cells, 3,090,000; white blood cells, 5,000; differential: 69 per cent polymorphonuclears, 26 per cent lymphocytes, 2 per cent eosinophils and 2 per cent monocytes. There were anisocytosis, poikilocytosis, achromia, and twelve stippled cells per high power field. The platelets were normal. The blood Wassermann and Hinton tests were negative.

Gastric analysis showed absence of free hydrochloric acid in the fasting sample; acid was also absent thirty minutes after 50 cc. of 7 per cent alcohol, and after 1 mg. of histamine intramuscularly. Lumbar puncture, August 21, showed an initial pressure of 75 mm. of water; 2,360 red blood cells; 52 mg. of protein per hundred cubic centimeters; colloidal gold test, 0011000000, and a negative Wassermann reaction. Roentgenograms showed a lead line in the epiphyses of both femurs. A recent sample of the whisky that he had been using for seven years showed 2 mm. of lead per liter. Biopsy of the gum showed microscopic deposits of lead sulphide.

The patient was given a diet rich in vitamins and calcium. At intervals, acidosis was induced with ammonium chloride. Iron ammonium citrate was given for the secondary anemia. The blood gradually approached normal over a period of five months, there being less variation in the size and shape, and less stippling of the red cells. During four months of this gradual deleading process he showed slow muscular improvement. By Jan. 2, 1932, he was able to raise his arms above his head. The shoulders, arms and grip of the hands were much stronger. The extensor muscles of the hands were still weak, especially the right. Ammonium chloride was prescribed and he was sent to the outpatient department. His condition continued to improve. In September he could make all movements normally, but his grip was still weak and he could not extend his wrists or raise his arms against strong pressure. Atrophy of the muscles of the hands, arms and shoulder girdle was still obvious. In January 1933 the muscles were apparently normal, although the patient stated that they were much smaller than before his illness. The only obvious abnormality was the loss of deep reflexes, the biceps, radial and ankle jerks being still entirely absent; the knee jerks were present but weak.

Lead as a poison to the nervous system has been known for centuries, but its effect on muscles, its storage in bones, and the deleading treatment by acidosis are modern advances of importance.[13] Like all substances injurious to the nervous system (viruses, bacterial toxins, metabolic toxins, and drugs), different forms of lead seem to attack different parts of the nervous system. Metallic lead and the oxides have a predilection in adults for the more distal muscles and nerves of the extremities, whereas tetra-ethyl lead (used in gasoline) attacks the cerebral cortex. In children the lead in paint almost invariably causes an encephalitis rather than a neuritis. What causes these specific vulnerabilities of certain tissues to certain poisons is unknown. Much has been written on the subject, especially by Oskar Vogt,[14] who calls the local susceptibility of certain parts of the nervous system to certain poisons "pathoklisis" and believes that it is due to "chemical affinity." Whatever the cause, it is a most remarkable phenomenon, and conspicuous examples are common: methyl alcohol especially affects the optic

13. Aub, J. C.; Fairhall, L. T.; Minot, A. S., and Reznikoff, Paul: Medicine **4**: 250 (Feb.-May) 1925.
14. Vogt, Oskar: J. f. Psychol. u. Neurol. **31**: 245 (June) 1925; abstr. Arch. Neurol. & Psychiat. **15**: 262 (Feb.) 1926.

nerve; the triorthocresol phosphate of "jake" paralysis [15] and the "patent medicine" named "Apiol" [16] affect almost exclusively the peripheral motor nerves; carbon bisulphide [17] chooses the sensory nerves of the hands and feet, while trichlorethylene [18] picks out the sensory part of the trigeminal nerve.

The list of metals, chemicals and chemical compounds that cause neuritis is long. In table 1 the best known are listed, but the list grows longer as industry advances and exposes its victims to new hazards. It was the airplane industry (stimulated by war) which in 1915 led to the discovery that trichlorethylene caused a sensory paralysis of the trigeminal nerve. Oppenheim [19] was called to see these workers, who were putting a liquid "dope" on airplane wings indoors. His interest was aroused not so much because of the strange new disease but because he instantly saw that the discovery could be turned to good by numbing the agonies in trigeminal neuralgia; it has since been amply proved that he was correct in his theory.

Medicines (patented and otherwise) cause their share of neuritis. Arsenic in the form of sodium cacodylate was formerly given in huge doses to relieve the muscular rigidity in Parkinson's disease; [20] it worked, but by the obviously undesirable means of causing a peripheral neuritis and thus cutting off the impulses from the central nervous system to the muscle. Mercury and silver rarely cause neuritic symptoms, perhaps because other obvious symptoms appear earlier. More insidious may be the effects of chloral, chlorbutanol, barbital, sulphonmethane and sulphonethylmethane. Worst of all was the devastation produced among the tipplers of the eastern and southern parts of the United States in 1930 by contaminating "jamaica ginger" with triorthocresyl phosphate.[21] Literally hundreds of men and women were given an incapacitating drop foot, many of them permanently. Just as bad, if less extensive, is the poisoning recently caused in Europe by the same substance in a popular "patent medicine" called "Apiol," used to bring on menstruation and abort early pregnancy. This poison (like certain viruses) affects the peripheral axon most, but with sufficient dosage the ventral horn cell is also injured and sometimes destroyed; this causes a permanent paralysis—a chemical "anterior poliomyelopathy."

It has long been held that ethyl alcohol caused polyneuritis. The usual conception was that the alcohol itself acted as a direct toxin on the axon and cell body of the nerve. The evidence for this is scanty; little experimental work [22] has been done which is not open to the criticism that the alcohol given not only acted as a toxin but also as a food, thus restricting the animal's intake of necessary vitamins. In human cases of alcoholic neuritis it is obvious that the imbibing of alcoholic beverages restricts the patient's diet and that neuritis apparently supervenes only after a prolonged dietary deficiency. This point of view has recently been put forward by Minot, Strauss and Cobb,[12] who have studied, during the last five years, a large group of cases with the dietary etiology in mind. They conclude that a lack of vitamin B is the probable cause of the neuritis. Moreover, two investigators [23] have tried the crucial experiment of treating cases of alcoholic neuritis and pellagra with large amounts of vitamin B during periods when the patient was still drinking large quantities of alcohol; marked improvement took place in spite of the ingestion of alcohol. It is obvious that alcohol is a toxin, but it may not be a neuritic poison to a man in good health. The situation is not a simple one. If ethyl alcohol per se caused neuritis, the disease ought to be even more common than it is. It may be that alcohol causes neuritis only in people already debilitated by inadequate diet and infection. To us it seems more probable that the alcohol acts only by restricting diet and that this restriction causes beriberi.

Another factor worthy of investigation in all cases of alcoholic neuritis is the possibility of impurities in the liquor imbibed. The great English epidemic of arsenic poisoning from beer [24] was at first looked on as alcoholic. More recently arsenic has been found in the urine of many patients with neuritis attributed to alcohol.[25] Lead also is a common contaminant of alcohol, as in the case just reported. Some investigators hold that it is not the alcohol but the contaminants that cause neuritis.

LOCAL NEURITIS

We have said that the polyneuritides with their systemic toxins and generalized symptoms were medically more important than the localized neuritides. This is certainly true as far as risk to life is concerned, but when one considers the great number of patients complaining of local neuritis seen in outpatient departments and private practice, one must admit that local neuritis is an important problem. Surgically it is of great interest because many cases of trauma to nerves need operation, tumors that press on nerves have to be removed, and orthopedic cases presenting abnormalities such as cervical ribs pressing on nerves, arthritic exostosis and fibrosis form a large group. Some of these are severe and painful; others cause only an incidental annoyance.

Edema in a nerve trunk may interrupt passage of the nerve impulses along the axons, especially if the edema happens to be at a point at which the nerve is passing through a bony canal. A common case in point is that of a facial nerve which leaves the skull through the stylomastoid foramen. Exposure of the face to severe cold, a strong wind or local cooling (as in driving a closed automobile with only one window open, so that the wind blows directly on the cheek) often brings on edema that blocks the foramen, presses on the facial nerve and causes paralysis, so-called Bell's palsy. Local infection may have the same result.

Fibrosis about nerves may cause pain, paresthesia or paralysis. One of the common localities where this may take place is along the external cutaneous nerve of the leg as it passes through a fibrous tunnel in the fascia lata. This local fibrosis causes the syndrome known as "meralgia paraesthetica." [26] Infection in wounds, as in military surgery, often leads to fibrosis

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19. Oppenheim, H.: Berl. klin. Wchnschr. **53:** 25, 1916.
20. Osler, William: The Principles and Practice of Medicine, revised by Thomas McCrae, Philadelphia, Lea & Febiger, vol. 6, 1928.
21. Merritt, H. H., and Moore, M.: New England J. Med. **203:** 4 (July) 1930. Mella, Hugo: A Preliminary Report on the Treatment of Paralysis Agitans, Arch. Neurol. & Psychiat. **7:** 137 (Jan.) 1922.
22. Braun, H.: Inaugural Dissertation, Tübingen, 1899.
23. Rhoads, C. P.: Personal communication to the authors, 1932. Spies, T. D., and DeWolf, H. F.: Am. J. M. Sc. **186:** 521 (Oct.) 1933.
24. Reynolds, E. S.: Lancet **1:** 166, 1901
25. Sheldon, W. D.; Doyle, J. B., and Osterberg, A. E.: The Significance of Chemical Studies in Diagnosis, Arch. Neurol. & Psychiat. **27:** 322 (Feb.) 1932.
26. Stookey, Byron: Meralgia Paraesthetica, J. A. M. A. **90:** 1705 (May 26) 1928.

about nerves with varying symptoms;[27] when the sympathetic nerves are involved in this way, a painful syndrome may result with vasomotor and trophic disturbances in the affected limb. This was described by Weir Mitchell in the Civil War and given the name "causalgia."[28] Fibrosis about joints may explain the striking but rare picture of neuritic pain with marked muscular atrophy sometimes seen in the distal portion of a limb when the proximal joints are rheumatic. The arthritis may not be especially conspicuous, and the muscular atrophy may be striking and rapid.

Local neuritis due to infection or bacterial toxin is uncommon except in diphtheria. In this disease the nerves near the seat of infection are frequently affected locally, causing palatal paralysis when the infection is faucial; other cranial nerves may be paralyzed and, of course, general polyneuritis is not rare. The most striking cases are those described by Walshe,[29] who saw wounds of the limbs infected with the diphtheria bacillus and local ascending neuritis in the contiguous nerves. Tetanus may act in much the same way, and even tetanus antitoxin when given repeatedly into one limb occasionally causes a local motor paralysis.[30]

We have seen one case in which repeated intravenous injections of gas bacillus antitoxin into one arm caused local motor paralysis of the biceps, triceps and shoulder muscles of that side. Reports of local neuritis following vaccination with cowpox are occasionally heard; these lesions, however, may be due to pyogenic organisms and not to the virus.

A rare but virulent form of neuritis may arise from streptococcic infection in wounds.[31] More chronic forms arise from infected bed sores in debilitated patients. Leprosy is the disease that gives the most obvious pathologic picture of a true local ascending neuritis; here the process is slow and the organisms may be easily identified under the microscope in the thickened nerve trunks.

Tuberculosis is usually mentioned as a cause of neuritis. Of course, tuberculous exudate or tubercle may act as a tumor and cause local pressure on nerves or even local invasion of nerve sheaths, but "tuberculous neuritis" is more a pathologic curiosity than it is a disease entity. Likewise, syphilis is always discussed in textbooks as a cause of neuritis. Myelitis affecting ventral horn cells and meningitis affecting nerve roots as they leave the cord are common in syphilis. Naturally they result in paralysis, muscular atrophy and other symptoms seen also in neuritis. True peripheral neuritis, however, due to syphilis we have never seen. The neuritis seen in terminal states of tuberculosis and syphilis is probably due to the cachexia and not to the infectious organisms.

SUMMARY

1. *The Polyneuritides That May be Caused by Virus Infection.*—The group of diseases caused by viruses is becoming rapidly larger as the problem is better understood, but our knowledge is still rudimentary in this field. Many of these diseases may be accompanied by peripheral neuritis, usually as a late complication; but when the virus attacks the spinal cord and nerves primarily the opposite is true. For example, the tenderness of the muscles in the early stages of acute anterior poliomyelitis is probably due to the beginning of degeneration of the neuron including the axon; thus, pathologically speaking, there is a neuritis. The acute infectious or acute febrile type of polyneuritis, illustrated by case 1, is becoming a well recognized entity. There is evidence that this is due to a virus, probably specific, but as yet unknown.

2. *The Polyneuritides That May be Caused by Absorption of Bacterial Toxins.*—A long list may be made of infectious diseases known to be complicated by polyneuritis. The obvious inference is that absorption of the toxins formed by the invading organism causes the neuritis. The reasoning, however, does not hold, for neuritis is usually a rare complication of these diseases, and other factors must be evoked in order to explain the occurrence. Of course the neuritis following "serum sickness" is the best evidence available that bacterial toxins cause neuritis. In typhoid and other prolonged fevers, vitamin deficiency must be considered as a possible etiology. In diseases that may be due to pyogenic organisms (e. g., the first ten on the list under bacteriotoxic, table 1), the neuritis rarely develops early in the course of the illness. Generally it is late, when the infection has become chronic, and then abscess formation with absorption from a chronic focus must be looked for and treated. The second case reported here is in point. A chronic neuritis, especially if accompanied by arthritis and myositis, may well be due to focal infection of this sort; infections of tonsils, teeth or gallbladder may be implicated. The term "rheumatism" is used to include all these, and it is emphasized that a mild neuritis is often overlooked when it occurs with a conspicuous arthritis. Not infrequently acute infection acts as a precipitating factor in neuritis owing to deficiency of vitamins; especially in children the acidosis resulting from fever may determine the onset of lead paralysis.

3. *The Polyneuritides That May be Caused by Vitamin Deficiency or Metabolic Disorder.*—Good evidence is fast accumulating to indicate that the many polyneuritic syndromes listed in table 1 under "deficiency in metabolism" are merely clinical variations of one etiologic group. The first thirteen on the list, at least, seem to be caused by deficiency in one or more vitamins. The neuritis of diabetes may perhaps be caused or precipitated by the dietary restrictions imposed on the patient. Little is known of the syndromes known as "recurrent" and "chronic progressive neuritis," but the descriptions suggest an etiology based on vitamin deficiency. The neuritides associated with myxedema and hematoporphyrinuria apparently have a metabolic origin, but using that term thus vaguely really explains little. All one can say is that knowledge is now advancing rapidly in this field; the isolated discoveries at first seem to complicate the picture; soon etiologic relationships will be clearer, and then the long list of clinical syndromes here set down may be reduced to a few recognizable diseases.

4. *The Polyneuritides That May be Caused by Chemical Substances Ingested.*—The neuritis caused by lead and by arsenic is well known. Modern industry has increased the hazards to which workers are exposed, and a list of eighteen substances is given in table 1 that are said to cause polyneuritis. The extraordinary specificity of some of these substances is emphasized; certain of them always appear to attack one special pair or group of nerves. It is argued that ethyl alcohol is not a neuritic poison but, when taken as a beverage,

27. Tinel, J.: Nerve Wounds, New York, William Wood & Co., 1917.
28. Pollock, L. J., and Davis, L.: Peripheral Nerve Injuries, New York, Paul B. Hoeber, 1933. Mitchell, S. W., and Keen, W. W.: Circular 6, Surgeon-General's Office, March 10, 1864.
29. Walshe, F. M. R.: Lancet **2**: 232 (Aug. 24) 1918.
30. Wilson, George, and Hadden, S. B.: Neuritis and Multiple Neuritis Following Serum Therapy, J. A. M. A. **98**: 123 (Jan. 9) 1932.
31. Orr, D., and Rows, R. G.: Brain **36**: 271, 1914.

either causes dietary deficiency and hence beriberi or causes neuritis because of impurities. A case is given of lead poisoning due to impure alcohol.

5. *The Local Neuritides Caused by Pressure and Trauma.*—These are largely surgical problems. Local edema and fibrosis are common etiologic factors often overlooked.

6. *The Local Neuritides Caused by Infectious Organisms and Their Toxins.*—These are rare except in the case of diphtheria.

Clinical Notes, Suggestions and New Instruments

SUCCESSFUL SUTURE OF A WOUND OF THE ASCENDING AORTA

ALFRED BLALOCK, M.D., NASHVILLE, TENN.

There has appeared in the literature only one report of the successful suture of a wound of the thoracic aorta. This operation was performed by Dshanelidze[1] of Russia. The reasons for the scarcity of successful cases are several. For purposes of this discussion, the aorta is divided into two portions; namely, that part which is within the pericardium and that which is without. Piercing injuries of the extrapericardial portion of the thoracic aorta usually result in early death

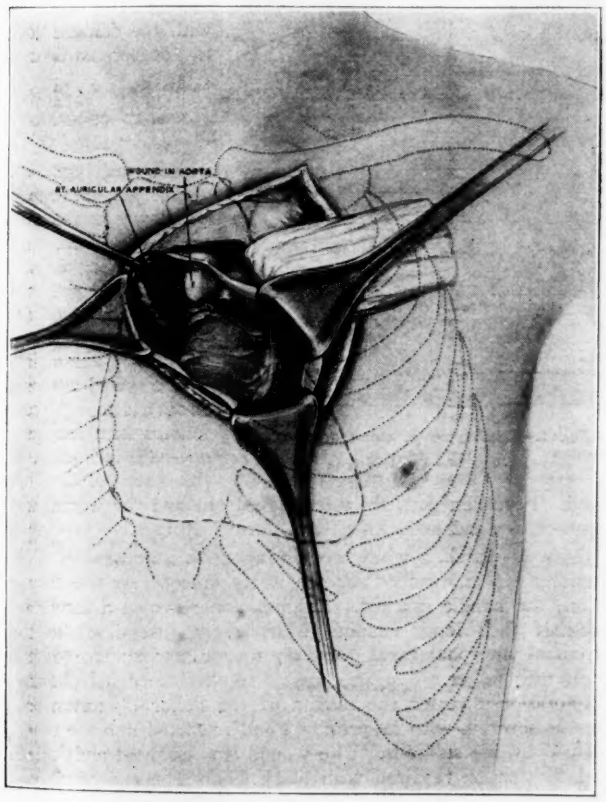

Fig. 1.—Incision used for the exposure of the heart and the wound of the aorta. A clamp was used for pulling the right auricular appendix to the right.

because there is no surrounding structure such as the pericardium to limit the loss of blood. The infrequency of wounds of the intrapericardial part of the aorta is due to its position behind the sternum and to the fact that it is quite short.

I have noted in studies on animals that relatively small wounds of the intrapericardial portion of the aorta are usually fatal unless treatment is instituted. A wound of the aorta 3 mm. in length usually causes death, while a similar opening in the intrapericardial part of the pulmonary artery does not. Wounds of twice this length of the left or right ventricular walls rarely cause death in the experimental animal.

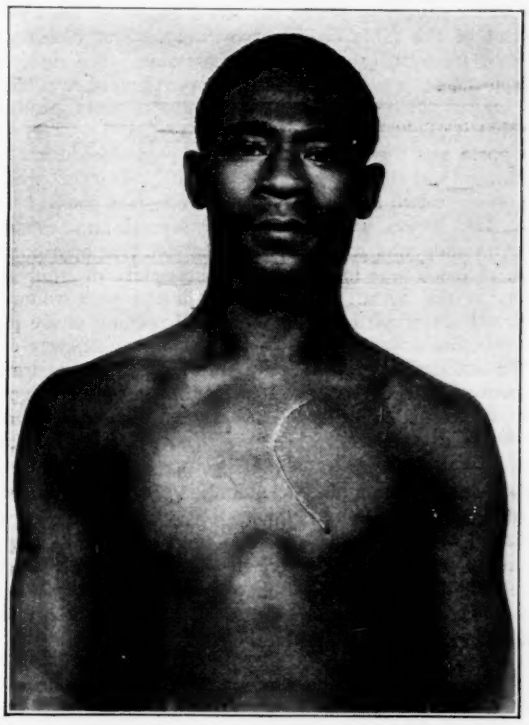

Fig. 2.—Appearance of the patient following the healing of the incision.

There follows the report of the successful suture of a wound of the intrapericardial portion of the ascending aorta of a Negro youth.

A Negro, aged 18, entered the Vanderbilt University Hospital, Sept. 17, 1932, approximately forty-five minutes after having been stabbed in the chest and neck with an ice pick. He was extremely restless, the respirations were labored, the skin was cold and clammy, the radial pulse could not be counted with accuracy, and the blood pressure was 50 mm. of mercury systolic and 40 mm. diastolic. There was a small wound immediately to the left of the sternum between the first and second ribs. There was no bleeding from this wound. The heart sounds were heard over the base with difficulty. The veins of the neck were quite distended. There was a small wound of the lower part of the neck on the left side.

A 7 foot plate of the chest was made shortly after the patient entered the hospital. This showed a partial pneumothorax of the right pleural cavity and a small amount of fluid in the left costophrenic angle. The shadow of the heart and pericardium was thought to be a little larger than normal.

The patient was then taken to the operating room and 500 cc. of physiologic solution of sodium chloride was introduced intravenously while preparation for the operation was being made. A reading of the blood pressure could not be obtained before or immediately after the injection of the salt solution.

Nitrous oxide and oxygen was used as the anesthetic. A left parasternal incision with its center over the third costal margin was used for the approach. The attachment of a large part of the pectoralis major muscle was divided. The second and third costal cartilages together with parts of their ribs were removed. The internal mammary artery and vein were doubly ligated and divided. By the use of a pair of rongeurs, a part of the sternum was removed. The pleura was reflected laterally on each side and the pericardium was exposed. Several

From the Department of Surgery of Vanderbilt University School of Medicine.

1. Dshanelidze, I. I.: Manuskript, Petrograd, 1922, quoted by Lilienthal, Howard: Thoracic Surgery, Philadelphia, W. B. Saunders Company 1: 489, 1926, and in Zentral Organ für die gesamte Chirurgie und ihre Grenzgebiete, 1923, p. 139.

31. Orr, D., and Rows, R. G.: Brain **36**: 271, 1914.

not a neuritic poison but, when taken as a beverage

attempts were made to grasp the pericardium with forceps, but these were unsuccessful, as it was quite tense. An incision was made into the pericardium and blood under pressure escaped. The quantity that was lost was estimated as 300 cc. As soon as the pericardium was opened, the blood pressure rose to 100 mm. of mercury systolic and 60 mm. diastolic. After the blood was sponged out from the pericardium it was observed that blood continued to accumulate in the region of the base of the heart. While this area was being sponged, a clot that was partially occluding an opening in the aorta was dislodged and a large stream of bright red blood shot over the screen at the head of the table on the anesthetist. The bleeding was controlled temporarily by digital compression. The right auricular appendage prevented a satisfactory view of the bleeding point, and a clamp was placed on the tip of the appendage in order that it might be held out of the way (fig. 1). The wound in the aorta was then closed with interrupted silk sutures. The first two sutures did not stop the bleeding. Traction was then made on these two sutures and a third one was placed between them. The wound was observed for several minutes and no further bleeding was seen. It was estimated that approximately 700 cc. of blood was lost during the procedure of suturing the opening in the aorta. The incision in the pericardium was closed with interrupted sutures. A small opening in the pleura, which had been made most likely by the ice pick, was closed, and the incision was then sutured tightly without drainage. The patient seemed to be in good condition at the completion of the operation. The pulse rate was 120 per minute, the systolic blood pressure 95 mm. of mercury and the diastolic 50 mm. A transfusion of blood was given shortly afterward.

There was an elevation of the temperature, pulse and respiration rate for several days following the operation. The patient complained of rather severe pain in the right side of the chest on several occasions. The incision healed by first intention without drainage and without having to be aspirated (fig. 2). He was discharged from the hospital, Oct. 25, 1932, and has remained well since that time.

A RAPID METHOD FOR THE DETERMINATION OF BLOOD EOSINOPHILIA

TOWNSEND B. FRIEDMAN, M.D., CHICAGO

In the diagnosis and study of the various allergic states it is frequently desirable to know the blood picture, especially the eosinophil count. The ordinary smear method, in which 200 or more cells are counted, is a time-consuming process and the chance for an error in the eosinophil count is great. Moreover, the result gives only the percentage of eosinophils in the number of cells counted. The method described here gives the number of eosinophils per unit volume of blood, is rapid and at the same time gives the leukocyte count.

Blood is collected in the usual manner for the blood count, accurately calibrated white cell pipets being used. In place of the usual acetic acid diluting fluid the following fluid, which is the modification of Camara and Alvarez [1] of that described by von Domarus,[2] is employed:

Aqueous eosin 1 per cent	5 cc.
Acetone	5 cc.
Distilled water	100 cc.

The count is made in the usual manner in the ordinary counting chamber. This diluting fluid stains only the eosinophilic cells and they are easily distinguishable with the high dry power of the microscope. The unstained leukocytes appear as gray bodies in this diluting fluid.

It is advisable to fill also a pipet with the ordinary acetic acid diluting fluid and use this count as a check until one has had some experience with the fluid described.

With this method I have found it very simple to follow the blood eosinophilia in asthmatic patients in their free period and during the acute attack.

From the Clinic of George Piness, M.D., Los Angeles.

1. Camara, P. de la, and Alvarez, J. Goyanes: Investigaciones sobre la sangre "in vitro," Arch. cardiol. y hemat. **13**: 315 (Aug.) 1932.
2. von Domarus, A.: Die Bedeutung der Kammerzahlung der Eosinophilen fur die Klinik, Deutsches Arch. f. klin. Med. **171**: 333-358, 1931.

PORCELAIN FAUCET HANDLE INJURIES

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The porcelain faucet handle as a common household hazard has received too scanty attention. Not only are the injuries incurred painful and dangerous, but the resulting disabilities are often prolonged because of the frequency of nerve and tendon damage. The matter has not been entirely neglected, but, probably owing to the manner in which papers have been titled, search of the recent literature has not yielded any information of like character.

Over a period of four years about twenty cases have been seen in the office, in the emergency service of a private hospital and at the public health center. Five office cases are presented here in brief to illustrate the variety of injuries.

All the injuries were produced by one of the two types of china or porcelain handles illustrated (fig. 1). The porcelain is cemented with plaster of paris over a metal core or about a central metal hub. A certain variety of faucet has a metal core, continuous through the entire length of the porcelain. This type is relatively much less dangerous. A sharp blow of the hand against one of the first two handles mentioned can readily shatter the porcelain. The neglected, leaking faucet calls forth most of these sharp blows.

The bare hand driven with force against these glasslike broken edges rarely escapes injury. All the injuries listed have been palmar or on the palmar surface of the fingers. They have been of the puncture wound type, the surface injury being minimal compared with the damage done to deeper structures (fig. 2).

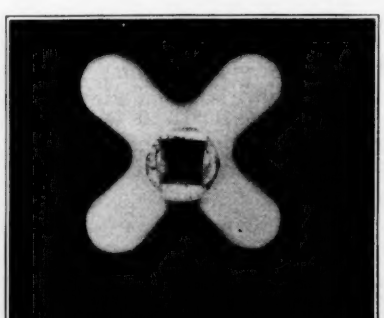


Fig. 1.—Two types of china or porcelain handles.

REPORT OF CASES

CASE 1.—E. M., a white man, aged 31, doing general repair work, was disabled for two weeks when, while he was testing a newly installed faucet, the handle broke off in his hand as he closed the faucet. Examination revealed a slicing laceration, three-fourths inch long and one-half inch deep, in the palm of the left hand. Porcelain particles were picked out and the wound was cleansed, iodized and closed with dermol sutures.

CASE 2.—E. G., a white woman, aged 24, a housewife, while washing dishes, reached for the water faucet. As she turned it off, the handle cracked. Examination revealed a laceration one-half inch long, running transversely just distal to the proximal interphalangeal joint on the palmar surface of the right fifth finger. She was unable to flex the distal phalanx. Exploration revealed the tendon of the flexor digitorum profundus severed, with its proximal end retracted into the tunnel formed by the sublimis. The wound was cleansed and iodized and the tendon repaired with black silk. The end result was poor flexion of the distal phalanx, probably because of adhesions. The period of disability was three weeks.

CASE 3.—L. L., a white woman, aged 22, a housemaid, while working about the house, cut her hand when a faucet handle cracked off as she turned off the water. Examination revealed a one-half inch transverse laceration in the palm of the left hand. She could not flex either interphalangeal joint of the index finger. Exploration under general anesthesia, with a tourniquet in place, showed severing of the tendons of the flexors digitorum profundus and sublimis to the index finger. The tendons were repaired separately with black silk. Active

motion was allowed in three weeks. There was 75 per cent normal motion in seven weeks. In eighteen weeks recovery was complete.

CASE 4.—G. A. M., a white woman, aged 48, a housewife, while working about the house broke off a porcelain faucet handle in her left hand. Examination revealed a 1½ inch

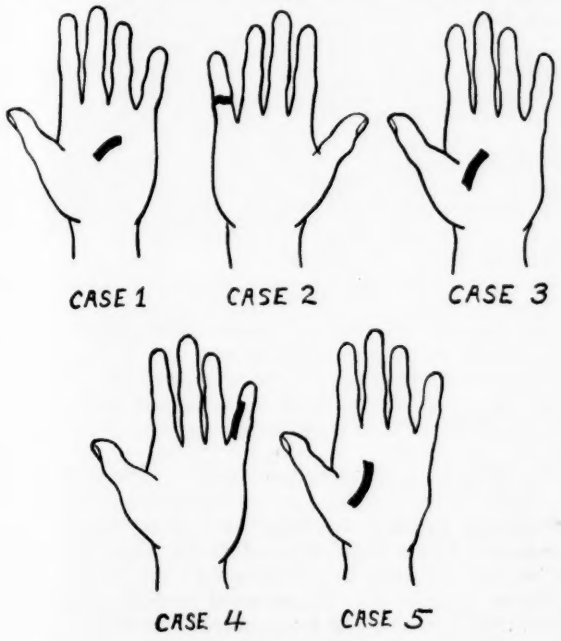


Fig. 2.—Location of injuries.

ragged laceration, roughly paralleling the medial palmar border of the fifth finger. The medial phalangeal artery was severed. The wound was cleansed, iodized and loosely closed. The period of disability was ten days. When last seen the medial half of the finger tip was still numb, although the severed nerve was not identified at the time of the injury.

CASE 5.—E. R., a white man, aged about 35, a garageman, received his injury when impatiently trying to close a dripping faucet by giving one additional twist. A 1 inch laceration was incurred, which bled freely. The laceration was in the central lateral half of the palm and extended proximally into the thenar eminence. Exploration revealed that the superficial volar artery was severed, as well as the branches of the median nerve to the short muscles of the thumb and the cutaneous supply to the lateral border of the index finger. Repair was tedious. Partial disability existed in the hand for six months. Disturbances in sensation still persisted after eighteen months, although muscular function was excellent.

COMMENT

These cases are illustrative of the lacerations that may occur. A slight variation is that of a male patient (not under my personal care) who, while seated in the bath tub, attempted to close the faucet with his foot. He suffered a large, jagged laceration of the sole.

These accidents are rather frequent. The opportunities for them are present in almost every household. They are preventable by substituting brass or chrome plated handles for the common porcelain type. Plumbers are aware that the handles very frequently break, but they have not been impressed by seeing the gravity of some of the injuries that occur. A chrome plated replacement handle of standard type is available at the same price as the ordinary porcelain handle. Other varieties with more style are to be had at slightly greater prices. Plumbing supply men feel that they must give the public what it wants and that is most often the porcelain handle; yet each household in which an accident has occurred feels "that there ought to be a law against such handles."

SUMMARY

1. The common porcelain faucet handle is a frequent source of injury and prolonged disability.

2. The injuries are characterized by minimal skin wounds with the frequent involvement of nerves, tendons and other deep structures.

3. Such accidents are largely preventable by early repair of leaking faucets to eliminate unnecessary force in closing, or fully preventable by substituting equivalent priced chrome plated handles for the porcelain ones.

4. Plumbers and plumbing supply men are aware of the hazard but answer that they must give the buyer what he wants.

5. Elimination of the hazard can be hastened by better informing the purchasing public.

411 Thirtieth Street.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY OF THE AMERICAN MEDICAL ASSOCIATION HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.

H. A. CARTER, Secretary.

BURDICK ELECTROSURGICAL UNIT ACCEPTABLE

The Burdick Corporation, Milton, Wis., manufactures an electrosurgical diathermy unit, Model No. SU-2, which differs from other electrosurgical units, since it makes use of two currents—one from a spark gap high frequency generator and the other from a tube oscillating unit. The two currents may be blended or used separately, depending on the will of the operator.

The spark circuit is of the standard type with a well built mica condenser across the transformer secondary. The three spark gaps are satisfactorily designed and readily removed for adjustment or repair.

The tube circuit is of the well known and efficient Hartley, parallel feed plate, using "raw" alternating current for its anode voltage. It is isolated from the spark circuit by means of two condensers, one of which is a rotary variable air condenser.

Two taps (high and low "dissection intensity") are provided on the primary of the plate transformer to give different plate voltages and hence different power output from the tube. The filament of the FP 1 tube is connected directly across the 110 volt terminals when the main switch is on and continues to operate at all times whether the foot switches are used or not.

The blending circuit contains a coil, common to both spark and tube oscillators, from which leads for coagulation or dissection are brought out. A third foot switch, not shown in the diagram, turns on both sparks and tube oscillators simultaneously. The two units operate without influence on each other to any marked extent and hence the output blended current is the sum of their individual outputs.

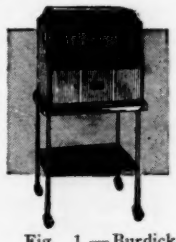


Fig. 1.—Burdick electrosurgical diathermy unit, Model No. SU-2.

All parts are rigidly mounted and the vulnerable tube and spark gap are readily accessible for replacement or repair. There appears to be sufficient ventilation to prevent overheating. A small and hence portable unit has been achieved by crowding the parts together. The electrical insulation is considered satisfactory. Sufficient and convenient control of the outputs has been provided. The table for carrying the instrument has reasonably large wheels, so that it rolls smoothly and easily.

Temperature runs have been made by the usual resistance method on the plate transformer (a rise of 14 degrees C. in two hours) and the spark transformer (a rise of 25 degrees C. in one hour and twenty minutes) with a heavy load in use. These temperature rises appear to be within the limits.

The tube oscillator operates at 95 meters wavelength.

The spark coagulator operates around 725 meters wavelength and contains a third harmonic whose amplitude is approximately one-fourth that of the fundamental. In one instance (only) the wavelength was altered to 900 meters. The condition was that of a heavy load when the maximum voltage (tap switch No. 6) was in use.

The blended cutting circuit gave out, simultaneously, the 95 meter and the 725 meter wavelengths.

There was no evidence on the oscillograph of a low frequency (shocking) voltage. (The oscillograph is not able to detect any voltages less than about 10 volts).

The power input was as follows:

With the tube alone, for cutting, from 500 to 600 watts.

With the spark alone, for coagulation, 350 watts.

With both tube and spark, for cutting, from 400 to 750 watts.

These wattages may be drawn from the lighting mains with safety. They correspond roughly to that needed for an electric iron.

The output is as follows:

Under various conditions a hot wire ammeter in series with the output lead indicated from 0.1 to 0.8 ampere, usually running around 0.3 ampere. These values are normal and satisfactory.

A Braun voltmeter across the tube cutting terminals (no load) indicated 250 volts. With the blended combination, it gave 500 volts.

After using this surgical unit in four breast amputations, one thyroidectomy, and several small benign tumors of the breast and of the skin, the clinical investigator for the Council believed that both the coagulating and cutting currents furnished

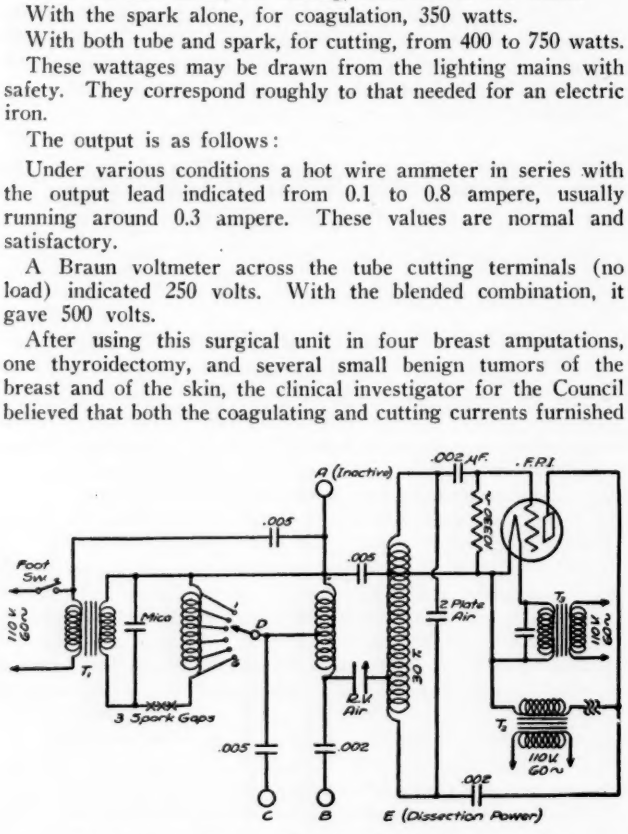


Fig. 2.—Circuit of Burdick electrosurgical diathermy unit.

by this unit were satisfactory and will do what the manufacturer claims for them. The investigator reported that the combined cutting and coagulating current gave the smooth cutting surface. When used for transurethral prostatic resection, it was reported as giving satisfactory service.

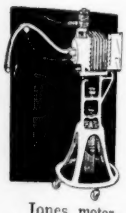
The Council regards the Burdick Electrosurgical Unit, Model No. SU-2, as satisfactory and includes it in the Council's list of accepted devices.

JONES MOTOR-BASAL APPARATUS ACCEPTABLE

The Middlewest Instrument Company, 1870 Ogden Avenue, Chicago, manufactures and markets this unit. The estimation of metabolism is derived from the time required for the subject to consume exactly one liter of oxygen. The oxygen is measured to one liter at standard pressure and temperature by means of an aneroid pressure gage with a device correcting for temperature. The technical measurements on the unit examined were accurate within 1 per cent. The consumption of oxygen is recorded on a plate moved at a uniform rate by clock work. The determination is started with the breathing chamber containing an unknown volume of air rich in oxygen. The slope of the tracing recording the consumption of oxygen is allowed to cross a base line. Then a liter of oxygen is introduced into the breathing chamber and the tracing is continued until its slope again crosses the same base line. The two slopes should be parallel to each other, indicating a uniform consumption of oxygen, and should be displaced from each other laterally by a distance corresponding to the liter thrust of the pen recording the movement of the bellows; that is, the distance which the pen moves when one liter of oxygen is introduced into the breathing chamber. Since the rate at which the plat moves is known, the time taken for the consumption of exactly one liter of oxygen, corrected to standard pressure and temperature, can be determined from the distance between the points where the slopes of the two tracings cross the base line before and after the addition of the liter of oxygen.

The calculation of metabolism is made by means of a slide rule on which are applied the data obtained from the tracings together with the weight, height, age and sex of the patient.

Any technical errors during a determination are detected by the use of a protractor supplied with the apparatus. This protractor consists of two parallel rulers, which can be set at a distance apart equal to the liter thrust of the breathing chamber. In case of error the parallel rules do not coincide with the slopes of the graph records before and after the addition of the liter of oxygen, because of either lack of parallelism or wrong spacing.



Jones motor-basal apparatus.

The liter thrust, on which the accuracy of the protractor depends, is not theoretically absolutely constant. Its variations are, however, quite small. The clock moves at a uniform rate of one inch per minute with a high degree of accuracy. Taken altogether, the errors of the apparatus are negligibly small in comparison to the deviations from uniformity in the breathing and metabolism of the human subject.

The absorption of the carbon dioxide by the alkali chamber is complete with or without the use of the motor blower. With the blower working, however, no positive pressure can be demonstrated in a vessel attached to the mouthpiece. This is to be expected, since at the same time that a current of air is blown out from one tube, an equal current is sucked by the other, thus producing only a movement of air around the mouthpiece. Breathing into the apparatus is comfortable.

A number of determinations of metabolism by means of this apparatus were made on different individuals under various conditions. The values obtained were essentially correct for normal, supernormal and infranormal metabolism.

The machine carries a "lifetime guarantee," meaning for the life of the original purchaser, but the rubber bellows are guaranteed for five years only. However, the general principle of the outfit appeared to be sound, and the use of the rubber bellows was considered meritorious.

The Council included the Jones Motor-Basal Apparatus in its accepted list of devices for physical therapy.

FISCHERQUARTZ "COLD" ULTRAVIOLET LAMPS ACCEPTABLE

The Fischer Corporation, 1261 South Brand Boulevard, Glendale, Calif., manufactures mercury glow type ultraviolet lamps. There are five models:

No. 95. Combination Fischerquartz lamp. This lamp has a grid type burner, mounted in a black bakelite hood. The hood with burner is detachable and weighs about 4 pounds. The cross-arm and the telescoping upright are adjustable. The transformer-control case is finished in black enamel and chromium. The base is black porcelain enamel with rubber-tired, ball-bearing casters. This unit supplies ultraviolet radiation for both orificial and general body treatments. Shipping weight, 78 pounds.

Fischerquartz "cold" ultraviolet lamp.

No. 87. Super Fischerquartz Lamp. This is the same as Model No. 95 without the orificial burner. Shipping weight, 73 pounds.

No. 59. Floor Model Fischerquartz Lamp. The upright and control case ends are finished in chromium. The control case is finished in black enamel. The base is in black porcelain enamel with rubber-tired, ball-bearing casters. Shipping weight, 55 pounds.

No. 76. Portable Lamp. This is a compact ultraviolet orificial lamp with transformer and controls in a plush-lined carrying case covered with black Keratol. Size 17 by 9½ by 5½ inches. Shipping weight, 20 pounds.

No. 67. Wall Model Fischerquartz Lamp. Substantially the same as Portable Model No. 76. Separate transformer and control mechanism may be attached to the wall. Shipping weight, 20 pounds.

Except for size, length of tube or shape, the burners for these lamps are essentially the same. The burners consist of a quartz-tubing about 7 mm. in diameter, which is highly evacuated of air and supplanted with an atmosphere of rare gases, xenon, krypton and argon, and a few drops of mercury. An electrical charge, taking place between the sealed-in electrodes, causes the lamp to glow, thus producing a light characteristic of a low pressure mercury vapor lamp.

In a physical laboratory acceptable to the Council, radiation tests indicated that more than 95 per cent of the total erythemogenic rays (of wavelengths 3,130 angstrom units, short waves) are emitted by the 2,537 A line. By means of the filter method, it was found that 97.8 per cent of the erythemogenic rays are contained in the strong emission line 2,537 angstrom units.

The Fischerquartz Ultraviolet Lamps are included in the Council's list of accepted devices for one year.

COLD QUARTZ ULTRAVIOLET GENERATORS REACCEPTED

The Electro Therapy Products Corporation, Los Angeles, manufactures the Cold Quartz Ultraviolet Generator. The following models have been considered:

Junior, Mobile, Body Lamp (B-8)
Junior, Mobile, Combination Lamp (C-8)
Junior, Mobile Stand Orificial (S-8)
Junior, Portable Combination (PC-8)
Senior, Mobile, Body Lamp (B-7B)
Senior, Mobile, Combination Lamp (C-7B)
Senior, Mobile, Stand Orificial (S-7B)
Senior, Portable, Orificial (P-7B)
Standard, Mobile, Combination (C-7)
Standard, Mobile, Body Lamp (B-7)
Standard, Mobile, Stand Orificial (S-7)
Standard, Portable Orificial (P-7)
DeLuxe, Combination (C-710)

The Council on Physical Therapy declares these lamps reaccepted for a period of three years.

STRETCH-A-WAY REDUCER AND HEALTH EXERCISER NOT ACCEPTABLE

The Stretch-A-Way Company, 4500 Magnolia Avenue, Chicago, manufactures a device known as the Stretch-A-Way Reducer and Health Exerciser. This product may be described as a pair of leather stirrups supported on a wooden cross-bar, and a handle, jointed by a heavy cord of live rubber, which furnishes the tension for the exercises. A strap is provided to fasten the device into the floor or under a door. The method used in exercising consists of pulling against the tension of the rubber.

The firm asserts that the outfit is used for reducing excess flesh and bases the claims on the improvement in blood circulation and the toning and strengthening of the body muscles, especially those of the abdomen. Advantage is taken of the massage effect through rolling on the stretched muscles. Strengthening of sagging muscles, reducing hips and thighs, and improvement of posture are further claimed. The company advises the patient moderation in eating. The company goes on to say that the device makes regular exercise interesting, convenient and practical.

An advertising pamphlet used in the marketing program was examined and the Council declared the following statements misleading, since no conclusive evidence was submitted to substantiate these claims:

"Reducer and Health Exerciser—The modern way to health, beauty, and slenderness through rhythmic stretching exercises."

"Treating the metatarsal arches: Place feet in stirrups and pull up against the middle of the soles of the feet, with handle up to the waist. Curl the toes downward alternately, as far as possible. A beneficial deep massage is obtained."

"Endorsed by medical authorities." The firm failed to give the names of the medical authorities who have endorsed the method.

In view of the unwarranted claims appearing in the advertising matter, the Council did not include the Stretch-A-Way Reducer and Health Exerciser in its list of accepted devices for physical therapy.

The Chemical Laboratory

THE FOLLOWING IS A REPORT OF THE CHEMICAL LABORATORY OF THE AMERICAN MEDICAL ASSOCIATION. PAUL NICHOLAS LEECH, Director.

THE STERILOMETER AND THE ASEPTIC-THERMO INDICATOR

Sterilometers, manufactured by the Sterilometer Laboratories, of Los Angeles, and Aseptic-Thermo Indicators, manufactured by the Aseptic-Thermo-Indicator Co., also of Los Angeles, are products designed for determining effective sterilization of certain types of materials. The products are designed for inclusion in or near the center of packages of goods for pressure-steam sterilization to determine whether or not adequate sterilizing conditions have been met throughout the depth of the material. The A. M. A. Chemical Laboratory has received several inquiries as to whether or not the products meet the claims made for them.[1]

The Sterilometer consists of a thermometer-like drawing on a piece of cardboard, the bulb and stem of which are of a light tan color. It is claimed that after a sufficient period of subjection to steam under pressure the column will match the bulb in a uniformly black color, and that this change takes place only after a period sufficient to insure complete sterilization (including destruction of spore-formers). The bulb is so constituted as to turn to black soon after exposure to heat, while the stem is the true indicator of sterilizing conditions. The Aseptic-Thermo Indicator is identical in principle and consists of a lavender arrow pointing to the figure 250° on a green dial.[2] Under conditions as outlined for the Sterilometer, the arrow matches the dial in color.

The two devices were called to the attention of the A. M. A. Chemical Laboratory by Dr. T. B. Magath of the Mayo Clinic, who had conducted a study of the Aseptic-Thermo Indicator. A small autoclave, susceptible of being heated to the desired temperature within thirty seconds and of being exhausted of steam and water in ten seconds, was constructed. The time and temperature recordings for this instrument were of established accuracy within limits, respectively, of ± 5 seconds and ± 0.5 C. With this apparatus, Indicators being selected at random, Dr. Magath obtained the results shown in table 1.

Twenty-five Indicators were used. After nineteen minutes the lavender color deepened to purple, yet Dr. Magath reported that the change to green did not occur until twenty minutes had elapsed, at which time all Indicator arrows matched their green dials. When the test was repeated at 126 C., the same condition obtained, except that the change occurred at sixteen and one-half minutes, again with all Indicators. In ascertaining the part played by moisture, twenty-five Indicators were submitted to dry, hot air at 170 C. for five hours. No change in color occurred. Because of a forty-second lag in the apparatus, the time recorded for color change to occur was considered as correct only within a possible error of ± 40 seconds (or a maximum error of eighty seconds). Except for that relatively inconsequential source of error, the work appears to be critical,

TABLE 1.—*Results Obtained with Aseptic-Thermo Indicators*

Steam at 15 pounds pressure		
Minutes	Temperature	Results
10	121 C.	No change in color
12	121 C.	No change in color
14	121 C.	No change in color
16	121 C.	No change in color
19	121 C.	No change in color
19.5	121 C.	No change in color
20	121 C.	Color change to green (matched)

1. In this consideration of the Sterilometer, and of the Aseptic Thermo-Indicator, the Dyack was not included because it belongs to that class of device whose reaction is largely dependent on temperature alone.

2. The reaction of these devices, according to their respective manufacturers are due (a) in the case of the Sterilometer to the formation of lead sulphide occurring at the melting point of a mixture of lead oxide, lead subcarbonate and sulphur; and (b) in the case of the Aseptic-Thermo-Indicator to an isomeric change of purple chromium sesquichloride to the green form.

precise and conclusive. The conclusion drawn is very broad and seemingly justifiably so:

> These Indicators are satisfactory for testing sterilization with steam under pressure for all uses in bacteriologic laboratories and hospitals.

Under the auspices of the A. M. A. Chemical Laboratory, a further investigation of the products was undertaken. This was performed in the laboratory of, and in collaboration with, the department of bacteriology of a well known medical school.

TABLE 2.—*Destruction of Micro-Organisms*

Duration of Autoclaving	Culture		Appearance of Indicator	
	B. Welchii	B. Subtilis	Sterilometer	Aseptic-Thermo Indicator
A. 5 minutes.....	+	+	No change	No change
B. 10 minutes.....	+	+	Partial change (brown stem)	No change
C. 20 minutes.....	—	—	Matched	Arrow still slightly reddish
D. 30 minutes.....	—	—	Matched	Matched

TABLE 3.—*Change of Color of Sterilometer*

Sample	Time, Minutes	Oven Temperature	Culture	Appearance of Indicator	
				Aseptic-Thermo Indicator	Sterilometer
1	5	168	+	No change	No change
2	10	168	+	No change	No change
3	15	171	+	No change	No change
4	20	171	+	No change	No change
5	25	176	+	No change	No change
6	30	177	No growth	No change	No change
7	35	182	No growth	No change	Complete change
8	40	186	No growth	No change	Complete change
9	45	184	No growth	No change	Complete change
10	50	185	No growth	No change	Complete change

The work was directed, roughly, toward investigating the various claims of the manufacturers as well as establishing a fair estimate of the reliability of the products.

The first experiment consisted in an investigation of the two products in autoclaves of two types (i. e., direct steam supply and gas-heated individual generators) and of various sizes. Conditions of temperature, pressure and duration of exposure were varied, as well, but constant for a given experiment. Twenty-three determinations were made, with the finding that no change in color of either the Indicators or the Sterilometers took place unless standard sterilizing conditions were met (20 pounds pressure of live, saturated steam for ten minutes of actual contact with the products). The variable, of course, is the time required for the penetration of steam into the packages being sterilized. In some instances, complete color change did not occur even though the so-called standard sterilizing conditions had obtained. This might be looked on as an additional margin of safety over and above the usual factor of safety in efficient sterilization.

The second experiment had to do with establishing whether or not complete color change indicated absolute destruction of all micro-organisms, including spore-formers. For this purpose one-centimeter squares of absorbent paper (Kleenex) were saturated with old broth cultures of B. subtilis or B. welchii and placed, one or the other, in sterile Petri dishes with a Sterilometer and an Indicator. At the conclusion of known periods of exposure to 15 pounds of pressure, the bacterial papers were removed with sterile forceps and deposited in favorable culture mediums. Control bacterial papers which were allowed to remain in sterile dishes at room temperature for as long as the duration of the longest autoclaving period were found to produce a good growth of both types of spore-former. The results are given in table 2. The conclusion, of course, is that a *complete* color change or "matching" of the indicators is evidence of complete sterilization.

Because of a statement that the "Sterilometer is so constructed that it changes color to black only in the presence of live steam," the next test was performed. Bacterial "squares" were again prepared, this time with B. anthracis, and employed as in the previous experiment except that, in this case, the dishes were placed in an oven for periods of from five to fifty minutes and with temperature varying from 168 C. to 185 C. The results are given in table 3. It is apparent that dry heat has no effect on the Aseptic-Thermo Indicator but that the Sterilometer exhibits complete matching throughout, after thirty-five minutes. Apparently, therefore, the Sterilometer is an efficient indicator of sterilization by dry heat as well as by steam-pressure. The experiment does, of course, refute the claim that the Sterilometer assures the presence of live steam, although such is actually the case with the Indicators. Baking the two types in an oven at 180 C. for ninety minutes produced no change in the Indicators but an almost complete change in one of the three Sterilometers so tested. Immersion in boiling water for periods of ten, fifteen and twenty minutes produced partial color changes of the Sterilometers but not of the Indicators, while exposure to the open Bunsen flame for thirty seconds produced complete matching in the case of the Sterilometers and, again, no change of the Indicators.

Information concerning effects of light, age, and so on, was then sought by placing sets of four each of the two types in (*a*) an incubator at 37 C. and (*b*) a paraffin oven at 56 C. At weekly intervals one of each was removed and checked against an unused control for stability of color and retention of indicator efficiency. With the same technic used with anthrax cultures as before, the results shown in table 4 were obtained.

The test products were all submitted to three weeks of incubator or paraffin oven conditions before being used. Such treatment caused the Sterilometers to undergo incomplete color changes when subjected to efficient steam-pressure sterilizing conditions, as compared to controls. The Aseptic-Thermo Indicators were not affected. Sunlight produced bleaching of the Sterilometer.

SUMMARY

The foregoing indicates that either type of indicator, whether Sterilometer or Aseptic-Thermo Indicator, is efficient in determining sterilization by the autoclave. The Sterilometer appears to be equally efficient in determining sterilization by dry heat but it has the disadvantage, as compared with the Indicator, that it is rendered irregular in its action by artificial methods of aging and is subject to complete color change in the open Bunsen flame and partial color change in boiling water. Apparently, neither product could cause a false feeling of security since, whenever the reaction or change was irregular, matching did not occur. The error in every instance was on the side of safety and failure of matching. Whenever color change had proceeded to the point of matching, sterilizing conditions had been met sufficiently to result in the destruction of all micro-organisms, including spore-formers. Naturally it is understood that the water vapor in the autoclave does not contain appreciable amounts of hydrogen sulphide, the presence of which theoretically might vitiate the results, in the case of the sterilometer.

TABLE 4.—*Effects of Light and Age*

Pressure and Time	Temperature, C.	Culture	Effect on Indicators	
			Sterilometer	Aseptic-Thermo Indicator
Control	37	+		
Control	22	+		
20 lbs. 2 min.	127	—	Control, brown Incubator, brown Paraffin oven, brown bulb; tan stem	Control, no change Paraffin oven, no change
20 lbs. 10 min.	127.5	—	Control, matched Incubator, matched Paraffin oven, brown bulb; not quite matched	Control not quite matched Paraffin oven, not quite matched
15 lbs. 5 min.	122	—	Remainder cannot be charted intelligently, since only one specimen of each was used and it is not stated whether such specimen is a control or one of the incubator or paraffin oven products; in no instance did the Indicators match; the Sterilometers matched in two, as noted by the asterisks	
10 lbs. 8 min.	118	—		
5 lbs. 25 min.	112	—		
15 lbs. 20 min.*	122.5	—		
10 lbs. 30 min.	116.75	—		
5 lbs. 90 min.*	112.75	—		

CONCLUSION

The Sterilometer and Aseptic-Thermo Indicator, if further studies are equally confirmatory, may be found of distinct value in hospitals and bacteriologic and pathologic laboratories.[3]

3. As with any automatic recording device, the human element plays an important part. For that reason it should be emphasized that these devices should be used with due regard for their location in surgical bundles, and for proper functioning of the autoclave itself.

Committee on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

VITAMIN D FORTIFIED PASTEURIZED MILK

Distributors.—

Bellevue Dairy, Syracuse, N. Y.
Baumann Dairy Company, Milwaukee.
Borgeson Bros. Dairy Company, Waterbury, Conn.
Brandes Creamery, Inc., Portland, Ore.
Brown Dairy Products, Inc., Argo, Ill.
Cherry Hill Dairy, Provo City, Utah.
City Dairy Company, Portland, Ore.
Cline Ice Cream Company, Charleston, W. Va.
Corning Milk and Cream Company, Inc., Corning, N. Y.
Downing Bros. Dairy, Rock Island, Ill.
E. H. Elton Dairy, Bristol, Conn.
Fairbank Farms, Dewitt, N. Y.
The Freeman Company, Flint, Mich.
Garden State Dairies, Millville, N. J.
Golden Rule Bakery and Dairy, Snoqualmie, Wash.
Hamilton Dairy Company, Chicago.
Jersey Milk Company, Portland, Ore.
Kraml Dairy, Chicago.
Lakeview Dairy, Cudahy, Wis.
Layton Park Dairy Company, Milwaukee.
Levengood Dairies, Inc., Pottstown, Pa.
Maplewood Cream Company, Portland, Ore.
Ogden Dairy Company, Chicago.
Peerless Dairy Company, Rock Island, Ill.
Pendell Dairy, Syracuse, N. Y.
Pioneer United Dairies, Everett, Wash.
Plymouth Dairy Company, Chicago.
Reiter's Dairy Company, Chicago.
Ruster Dairy Company, Grand Rapids, Mich.
Salt Lake Milk Producer's Assn., Salt Lake City, Utah (Farmilk).
Sanford's Overlook Farms Dairy Company, Waterbury, Conn.
Sanitary Farms Dairy, Inc., Erie, Pa.
Schiller Park Dairy, Syracuse, N. Y.
Sheffield Farms Company, Inc., New York.
Southern Dairies, Rocky Mount and Wilson, N. C.
South Side Dairy Corp., Syracuse, N. Y. (Blue Ribbon).
Sunset Dairy Company, Chicago.
Sunshine Dairies, Utica, N. Y.
Twin Pines Farm Dairy, Inc., Detroit.
United Dairies, Inc., Highland Park, Mich.
Utah Wasatch Dairy, Inc., Provo, Utah (Challenge).
Vitex Laboratories, Elgin, Ill.
Vitex Laboratories, Waukegan, Ill.
Vitex Vitamin D Milk Laboratories, Inc., Buffalo.
Weber Central Dairy Association, Inc., Ogden, Utah.
Wendt's Dairy, La Salle, N. Y.
White Eagle Dairy Company, Chicago.
Wilke Dairy Company, Milwaukee.
Willow Farm Products, La Grange, Ill.
Woodlawn Farm Dairy Company, Wilkes-Barre and Scranton, Pa.

Description.—Bottled pasteurized milk fortified with vitamin D (vitamin D concentrate prepared from cod liver oil); contains 400 U. S. P. X (Revised, 1934) vitamin D units per quart.

Preparation.—The milk complies with legal requirements and is pasteurized by the standard holding method. See THE JOURNAL, July 1, 1933, page 34, for description of fortification with vitamin D.

Vitamins.—The vitamin D concentrate used and the fortified milk are regularly tested biologically. Clinical investigation shows this milk to be a reliable antirachitic agent, if the proper amount is used.

Claims of Distributors.—A vitamin D fortified, antirachitic pasteurized milk having otherwise the flavor and food values of usual pasteurized milk.

BORCHERDT'S MALT SOUP EXTRACT WITH ADDED POTASSIUM CARBONATE

Manufacturer.—Borcherdt Malt Extract Company, Chicago.

Description.—Concentrated nondiastatic malt extract with added potassium carbonate.

Manufacture.—Crushed barley malt is admixed with warm water and stirred for a definite period; a given quantity of hot water is added and steam is introduced until the temperature of the mix rises to the desired point, at which it is held for a definite period, after which the water solution is removed from the grain, filtered, and partially evaporated. Potassium carbonate is added to this malt extract (1.1 Gm. of potassium carbonate to 100 Gm. of extract) and the mixture is further concentrated in "vacuum" to the desired density, and packed in bottles.

Analysis (submitted by manufacturer).—

	per cent
Moisture	21.8
Ash	2.5
Potassium carbonate	1.1
Fat (ether extract)	0.0
Protein (N × 6.25)	6.4
Reducing sugars as maltose	57.6
Dextrins (by difference)	11.7
Calcium (Ca)	0.02
Chlorine (Cl)	0.01
Iron (Fe)	0.0006
Magnesium (Mg)	0.09
Phosphorus (P)	0.29
Potassium (K)	1.10
Silicon (Si)	0.04
Sodium (Na)	0.08
Sulphur (S)	0.05

Not diastically active.

Calories.—3.0 per gram; 85 per ounce.

Vitamins.—Sixty units of vitamin B complex (Sherman and Spohn method) per ounce.

Claims of Manufacturer.—A laxative modifier in the diet of obstinate cases of constipation in bottle fed babies. Is mixed with water, whole milk and wheat flour in certain proportions to make Keller's Malt Soup for special diets of infants.

SANKA COFFEE
(97% OF THE CAFFEINE REMOVED)

Manufacturer.—Sanka Coffee Corporation, New York, subsidiary of General Foods Corporation, New York.

Description.—Decaffeinated Santos, Bogotas and Mocha coffees, retaining approximately 3 per cent of the natural caffeine.

Manufacture.—Green coffee is cleaned, steamed and the caffeine extracted with trichloroethylene, which is removed by steam distillation. The different coffees are blended to produce a standard coffee beverage, roasted and automatically packed under vacuum in tins. Every batch is tested to insure at least 97 per cent removal of caffeine.

Analysis (submitted by manufacturer).—

	per cent
Moisture	3.1
Water soluble solids	24.5
Ash	3.9
Fat (petroleum ether extract)	15.1
Protein (N × 6.25)	6.9
Caffeine	0.03
Caffetannic acid	1.1
Crude fiber	22.4
Carbohydrates other than crude fiber (by difference)	48.6

Claims of Manufacturer.—Retains normal coffee flavor. Recommended to those suffering from nerves, sleeplessness and other conditions which may be aggravated by caffeine.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, NOVEMBER 24, 1934

THE CONFERENCE ON ECONOMIC SECURITY

In his address to the National Conference on Economic Security, November 14, President Franklin D. Roosevelt made the following statement on the subject of old age pensions and sickness insurance:

> I do not know whether this is the time for any federal legislation on old age security. Organizations promoting fantastic schemes have aroused hopes which cannot possibly be fulfilled. Through their activities they have increased the difficulties of getting sound legislation; but I hope that in time we may be able to provide security for the aged—a sound and uniform system which will provide true security.
>
> There is also the problem of economic loss due to sickness—a very serious matter for many families with and without incomes and therefore an unfair burden upon the medical profession. Whether we come to this form of insurance soon or later on I am confident that we can devise a system which will enhance and not hinder the remarkable progress which has been made and is being made in the practice of the professions of medicine and surgery in the United States.

These words are to the medical profession, among the most encouraging to come from the conference. They recognize the fantastic character of many of the schemes that have been proposed for these types of economic security. They indicate also a realization of the necessity for developing changes in the nature of medical practice that will neither break down the quality of medical care nor impede medical progress.

The report of the deliberations of the Medical Advisory Board would seem to indicate a tendency on the part of the advisers to follow the lead of the President in prefacing action and recommendation by study and investigation.

In her statement to the National Conference on Economic Security, Miss Frances Perkins, Secretary of Labor, said:

> Ill health is a hazard which may strike at any age and is rendered particularly distressing by the economic considerations that are involved. Through its Public Health Service the government has for a long time accepted a certain measure of responsibility for the health of the people. That service, by its preventive and educational work, has played an increasingly valuable part in improving the national standards of health. But we cannot shut our eyes to the fact that vast numbers of our people in time of sickness are unable to pay the cost of necessary medical attention.
>
> From time immemorial the members of the medical profession have cared for the needy without thought of reward. They have consistently rendered this noble and unselfish service, but we cannot in fairness ask them to carry indefinitely a burden which under the stress of modern conditions becomes daily heavier. Our problem is to bring adequate medical care within the reach of those who cannot at present afford it, and at the same time to safeguard the highest interests of that profession which has always given without stint of its services to the care of suffering and needy humanity. To this end the cooperation of the medical profession is vital and I have every confidence that such cooperation will be accorded by the profession, which has always had such fine traditions of public service.

Miss Perkins in concluding her remarks emphasized the statement by the President that "we must not lose sight of the fact that economic recovery must come before everything else and that unemployment insurance, as well as the other parts of the economic security program, will have to be developed as a cooperative federal-state undertaking."

The Medical Advisory Board to the Committee on Economic Security held its meetings on November 15 and 16. A brief statement appears under Association News in this issue (p. 1627). There is apparent a desire to enlist the cooperation of the entire medical profession in the development of recommendations that will answer the desire of the social leaders for better provision of medical care to the lower income groups in our population and at the same time protect the advancement of scientific medicine, the quality of medical care and the private practice of medicine. It is no secret that all of the plans thus far brought forward involve tremendous expenditures of money, running into billions of dollars annually, and this too at a time when budget balancing is a problem to tax the most astute minds that the administration is able to command. An evidence of the tendency to proceed with due caution is the recommendation by the Medical Advisory Board[1] of the addition to the technical staff that is studying this problem of Dr. R. G. Leland and Mr. A. M. Simons of the Bureau of Medical Economics of the American Medical Association. The technical staff previously included Dr. Edward Sydenstricker and Messrs. I. S. Falk, Michael Davis and Nathan Sinai. It is understood that this technical staff will make the basic studies and fact-finding investigations that are necessary before the committee can proceed intelligently to formulate its final recommendations.

The headquarters office of the American Medical Association has been besieged with telephone calls, telegrams and letters on this subject ever since the plans for this conference were first made public. Some physicians are apparently opposed to all change and feel that the American Medical Association should officially make itself felt in opposition to the entire program of

1. The members of this board include: Dr. Harvey Cushing, New Haven, Conn.; Dr. Walter L. Bierring, Des Moines, Iowa; Dr. James Alexander Miller, New York; Dr. Robert B. Greenough, Boston; Dr. James D. Bruce, Ann Arbor, Mich.; Dr. Rexwald Brown, Santa Barbara, Calif.; Dr. Thomas Parran, Albany, N. Y.; Dr. George W. Crile, Cleveland; Dr. Stewart R. Roberts, Atlanta, Ga.; Dr. George M. Piersol, Philadelphia, and Dr. J. Shelton Horsley, Richmond, Va.

the government. While the House of Delegates of the American Medical Association has repeatedly voiced its opposition to the socialization of medical practice, it indicated, in its sessions at Cleveland last June, its belief in properly controlled experimentation with new forms of medical practice, subject to the retention of certain basic principles recommended by its own special committee. This is the policy which THE JOURNAL and the *Bulletin* of the Association have supported to their utmost.

It now remains for the medical profession, individually and collectively, to impress itself and its views on the members of the Medical Advisory Board of the Committee on Economic Security. Bear in mind that the physicians on this board were selected largely not as representatives of the medical profession but as physicians who have expressed in various ways definite points of view in relationship to the social changes that seem to be in progress.

PROGRESS IN THE STUDY OF EVOLUTION

In the Penrose Memorial Lecture before the American Philosophical Society, the Princeton biologist Edwin G. Conklin traces the progress of a generation in the study of evolution. A recapitulation of this instructive lecture [1] may be of interest. At the beginning of this century the study of evolution entered a new era. This study before had been based largely on observation and deduction. While the fact of evolution was accepted generally by scientists, the factors concerned were largely matters of personal opinion and speculation. As Conklin says, what seemed probable to one seemed very improbable to another. But in 1900 Mendel's principles of heredity were rediscovered and genetics, a new experimental science of heredity, was born. The actual laws of heredity begin at last to be established. In the following year De Vries published his great work on the mutation of the evening primrose, which was living evidence of evolution under experimental conditions. The mutation theory of evolution is now well established. Mutations are inherited and represent changes in the germ cells, while changes in developed organisms, fluctuations, are not inherited. Herein, Conklin points out, lies the chief distinction between the older and the newer views of evolution, which hold that the changes are wrought first in the germ cells. Almost at the same time as Mendel's principles of heredity and as the mutation theory were recognized came the discovery of the relation of the phenomena in question to the germ cells.

On the average the offspring inherits as many traits from one parent as from the other. Since it receives an equal number of chromosomes from each parent, there seemed good reason to conclude that the chromosomes carry the factors of inheritance. Now certain differences were found in the chromosomes of males and of females, the male lacking certain hereditary materials found in the female, on which sex depends. "Thus the initial cause of sex, which had been a subject of speculation for thousands of years, was found in a difference in certain chromosomes in the two sexes." The next step was the discovery that the parental chromosomes unite into synaptic pairs and that the subsequent separation in the reduction division exactly parallels the mendelian segregation of characters, thus explaining mendelian inheritance. In this establishment of the cytologic basis of inheritance, American investigators have taken a leading part.

Within the first five years of this century the mendelian law of heredity, the mutation theory of evolution, the failure of selection to build new species, and the chromosomal mechanisms of sex determination and inheritance were established. Today the problems of evolution center largely in the germ cells. "The germ cells are the only living bonds not only between generations but also between species, and contain the physical basis, not only of heredity but also of evolution." Remember that the older naturalists thought of evolution only as changes in mature organisms under environmental influences. Among the significant advances of the most recent study of evolution Conklin mentions especially analysis of the causes of mutations. These may be caused by changes in the numbers and association of whole chromosomes, changes in the composition of individual chromosomes, and changes in the ultimate inheritance units or genes themselves. Numerous examples are cited of new mutant species by changes in the whole chromosomes. Mutations caused by changes in the genes (which lie in the chromosomes) have been found in almost all animals and plants bred in large numbers under experimental conditions. The animal most used is the vinegar fly, "the most famous animal in the world" in the field of evolution or heredity. This fly can be bred easily, so that a new generation is obtained every twelve days; it has a large number of readily recognizable hereditary characters, and it has only four pairs of chromosomes, readily distinguishable. More than 500 mutations, affecting various parts, have been found in this fly during the past twenty-five years. By ingenious methods, particular mutant genes have been located in particular chromosomes and even in particular regions of these. The leader in this study has been Thomas Hunt Morgan, who received the 1933 Nobel prize in medicine in recognition of the fundamental importance of his work. The nature of the changes in the genes that result in mutations is not known. "The fact that it may affect one gene and not another similar one that is not more than one thousandth of a millimeter away would seem to indicate that it is not some general environmental influence." X-rays and radium may cause gene mutations. Heating the eggs sufficiently to kill most of

1. Conklin, E. G.: A Generation's Progress in the Study of Evolution, Science 80: 147 (Aug. 17) 1934.

them may result in survivors of new types. We are now at the very beginning of any understanding of the nature and full significance of gene activity in embryology and in evolution. Conklin points out that mutations generally are regressive and seem to lead nowhere. This weakness in the mutation theory is met by the possibility that natural selection eliminates useless mutations and slowly builds up "the marvelous combinations of useful adaptations that all organisms possess." Adaptations, says Conklin, are still the greatest problem of biology.

Is Darwin's principle of the elimination of the unfit and the survival of the fit the only explanation? Darwin relied on inheritance of the effects of use and disuse as an aid in natural selection, but the evidence of genetics shows conclusively that these effects are not inherited. Conklin follows Weismann in extending the principles of selection to many of the reactions of organisms, which are, he says, generally able to select between that which is satisfactory and that which is not. "No one can at present explain this property of life, but apparently it is a general characteristic of all living things." In other words, the selection is not exclusively by way of the environment, as the organism itself can select or reject. As Weismann said, the selection principle "does not create the primary variations but it does determine the paths of development which these follow." Thus we are brought face to face again with fundamental problems of life from a new angle.

THE PINEAL BODY

Of the organs reputed to have an internal secretion, the pineal body has thus far successfully eluded all efforts to determine its function. As patients with tumors of this organ have been found to exhibit changes characteristic of precocious puberty, a relationship of the pineal body to sexual physiology has been postulated. But the results of pinealectomy in the hands of different investigators have been conflicting and confusing. Uniform effects on the primary or secondary sexual apparatus in either male or female could not be elicited.

The discovery independently by Silberstein and Engel [1] in Vienna and by Saphir [2] in Chicago that the pineal body contains estrogenic substance adds to the problem of the physiologic rôle of this organ. Silberstein and Engel worked with the pineal bodies of steers and calves, Saphir with those from human beings; the presence of estrogenic substance could readily be demonstrated by the Allen-Doisy technic after implantation of small pieces of pineal tissue into castrated mice. The Vienna investigators found that the estrogenic substance could not be extracted by alcohol, ethyl ether and acetone. This is a curious observation in view of the fact that the estrogenic fractions of the ovary, placenta, blood and urine are known to be soluble in varying degrees in these liquids. The estrus-inducing factor of the pineal body could, however, be taken up by dilute alkali but not by dilute acid, from powder remaining after acetone extraction.[1] A 640 mg. pineal body of a steer was found to contain at least 16 mouse units of estrogenic substance,[1] while Saphir [2] reported that the human organs, weighing on an average about 150 mg., contained at least 2 to 3 mouse units each. The Chicago investigator found estrogenic activity in the pineal bodies of both men and women and in that of a child (sex not stated). A gonad-stimulating effect of pineal tissue could not be detected by injection either into mice [2] or into rabbits,[1] nor did the intramuscular implantation of this material into mature female mice notably affect their sexual cycles.[2]

The significance of these results is obscure. It remains still to be determined whether or not the estrogenic factor of the pineal body exerts any important normal function in the physiology of the sexual organs, male or female. It must be remembered, for instance, that estrogenic substance may regularly be found in the male, yet no definite normal function has yet been attributed to this factor in this sex. The relationship of the pineal estrus-inducing substance to that found in other organs, tissues or body fluids is, of course, not yet known.

It is therefore too early to speculate as to the activity of the pineal body in the normal animal. The important investigations of Silberstein and Engel and of Saphir appear, however, to constitute a significant step in the eventual elucidation of the function of this organ.

1. Silberstein, F., and Engel, P.: Ueber das Vorkommen einer östrogenen Substanz in der Epiphyse, Klin. Wchnschr. **12**: 908 (June 10) 1933.
2. Saphir, William: Concerning the Function of the Pineal Body, Endocrinology **18**: 625 (Sept.-Oct.) 1934.

Current Comment

THE VITAMIN C CONTENT OF HUMAN TISSUES

The recent isolation of vitamin C, its identification and its synthesis have opened a new field for the investigation of the physiologic rôle of this substance in the organism. Harris and his co-workers [1] in England determined by chemical methods its rate of excretion in the urine following oral ingestion. It was suggested that this method might serve as a means of determining latent scurvy in patients before detectable clinical signs appear. More recently Yavorsky, Almaden and King [2] in this country have assayed also by chemical means the vitamin C content of various human tissues obtained at necropsy. Material was obtained from sixty-seven individuals ranging in age from birth to 70 years. Thirty-one were less than 10 years old; of these the vitamin C content of the tissues was so low in four that latent scurvy was evident. In six of

1. Harris, L. J.; Ray, S. N., and Ward, Alfred: The Excretion of Vitamin C in Human Urine and Its Dependence on the Dietary Intake, Biochem J. **27**: 2011 (No. 6) 1933. The Estimation of Vitamin C, editorial, J. A. M. A. **102**: 1852 (June 2) 1934.
2. Yavorsky, Martin; Almaden, Philip, and King, C. G.: The Vitamin C Content of Human Tissues, J. Biol. Chem. **106**: 525 (Sept.) 1934.

the remaining thirty-six patients the tissues were so depleted in the vitamin that the concentrations of the latter reached the levels found in terminal human or guinea-pig scurvy. While Yavorsky and his co-workers do not report the clinical diagnoses in the various individuals studied, they state that there had been no specific consideration of scurvy in any instance. A number of the patients apparently had been on dietaries low in the antiscorbutic factor for some time preceding admission to the hospital. The concentration and distribution of vitamin C in the various organs was found to correspond more or less closely with those in the guinea-pig. However, a wide range of variation occurred among the different patients. The results of the Pittsburgh investigators further suggest that chemical examinations of body fluids for vitamin C might be of considerable clinical value.

Association News

MEETING OF MEDICAL ADVISORY BOARD OF COMMITTEE ON ECONOMIC SECURITY

The Medical Advisory Board, appointed by Secretary Perkins, chairman of President Roosevelt's Committee on Economic Security, to advise the committee's technical staff in its study of programs of public health, medical care and health insurance, met in Washington on November 14 and 15. The board met in executive session with all its members present as follows: Drs. Walter L. Bierring of Iowa, Rexwald Brown of California, James Deacon Bruce of Michigan, George W. Crile of Ohio, Harvey Cushing of Connecticut, Robert B. Greenough of Massachusetts, J. Shelton Horsley of Virginia, James Alexander Miller of New York, Thomas Parran Jr. of New York, George M. Piersol of Pennsylvania and Stewart R. Roberts of Georgia. Other persons attending the meeting included Edgar Sydenstricker, in charge of the medical and health phases of the studies of the Committee on Economic Security, I. S. Falk of the technical staff, and by invitation Dr. R. G. Leland and A. M. Simons of the Bureau of Medical Economics of the American Medical Association.

Nathan Sinai, Michael M. Davis and W. Frank Walker also met with the board as consultant staff members associated with the dental, hospital and public health advisory committees which have also been appointed by Secretary Perkins and which are to meet in the immediate future. The meeting was opened by short addresses from Secretary Perkins and Edwin E. Witte, executive director of the Committee on Economic Security. Secretary Perkins and Mr. Witte requested the close cooperation and advice of the medical profession in developing the health aspects of the President's program for economic security. Owing to the fact that the Medical Advisory Board will make its recommendations to the Committee on Economic Security no public statement of its deliberations was given out, but we are informed by Mr. Witte that the technical staff of the committee presented to the board tentative proposals on the three subjects above mentioned in extending and improving public services, tax supported medical care for dependents and other population groups affected with certain diseases and health insurance against illness.

Health insurance was discussed from the point of view of considering the details of a plan suitable to the various needs of the American people and the interests of the medical professions in the event that legislation on this subject is proposed by the administration. The board requested an extension of time for this study. Arrangements were effected whereby Dr. Leland and Mr. Simons will participate in this study with the technical staff. It is anticipated that the board will meet again within the next six weeks or two months.

THE ATLANTIC CITY SESSION

Application for Space in the Scientific Exhibit

Application blanks are now available for space in the Scientific Exhibit at the Atlantic City session of the American Medical Association, June 10-14, 1935. The Committee on Scientific Exhibit requires that all applicants fill out the regular application form and requests that this be done as early as convenient.

Persons desiring application blanks should address a request to the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

MEDICAL BROADCASTS

Columbia Broadcasting System

The American Medical Association broadcasts on a western network of the Columbia Broadcasting System each Thursday afternoon on the Educational Forum from 4:30 to 4:45, central standard time. The next two broadcasts will be delivered by Dr. W. W. Bauer. The titles will be as follows:

November 29. Holiday; no broadcast.
December 6. Keep Fighting Diphtheria.
December 13. Shopping for Health.

National Broadcasting Company

The American Medical Association broadcasts under the title "Your Health" on a Blue network of the National Broadcasting Company each Tuesday afternoon from 4 to 4:15, central standard time. The next three broadcasts will be as follows:

November 27. Dollars and Disease, Morris Fishbein, M.D.
December 4. The Quick Lunch, W. W. Bauer, M.D.
December 11. Care of the Handicapped, Morris Fishbein, M.D.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARKANSAS

Personal.—Dr. Walter C. Overstreet, Jonesboro, has resigned as health officer for Craighead County.——Dr. Sherod A. Drennen was elected acting mayor of Stuttgart, October 3.

Society News.—Dr. Arthur B. Chase, Oklahoma City, among others, addressed the Tenth Councilor District Medical Society at Fort Smith, September 18, on "Pain in Heart Disease."——At a meeting of the Mississippi County Medical Society in Blytheville, October 2, Drs. Robert G. Henderson and John P. Henry, Memphis, Tenn., discussed skin diseases and allergy, respectively.——The Pope County Medical Society was addressed at Russellville, October 11, by Drs. John M. Smith on "Gallbladder Disease and Associated Pathology" and Robert H. Hood, "Dietetic Treatment of Gallbladder Disease."——Speakers before the Fifth Councilor District Medical Society at Camden, October 11, were Drs. Hugh L. Moore and George L. Carlisle, Dallas, Texas, and James A. Warner, St. Louis.——At a meeting of the Pulaski County Medical Society in Little Rock, October 1, Drs. John L. Kantor, New York, and Paul B. Magnuson, Chicago, discussed "Functional Disturbances of the Gastro-Intestinal Tract" and "Diagnosis of the Causes of Low Back Pain," respectively. Dr. Andrew C. Ivy, Chicago, addressed the society, October 6, on "Etiology and Therapeutic Rationale of Peptic Ulcer."

CALIFORNIA

Dr. Ashley Named Health Officer.—Dr. Nolton N. Ashley has been appointed health officer of Oakland, succeeding Dr. Arthur Hieronymus, who has held the position since 1931. Dr. Ashley is 44 years of age and a graduate of the University of Louisville School of Medicine.

Medical Board Reelected.—At a meeting of the state board of medical examiners in Sacramento in October, the following physicians were reelected: William R. Molony, Los Angeles, president; Clark L. Abbott, Oakland, vice president, and Charles B. Pinkham, San Francisco, secretary-treasurer.

University News.—Dr. Robert F. Loeb, associate professor of medicine, Columbia University College of Physicians and Surgeons, New York, conducted a clinic on diabetic acidosis before the faculty and students of the University of California Medical School, October 13. Dr. Frank B. Young, Long Beach, addressed the faculty and students, October 10, on "The Antiquity of Diseases."

County Society Library Opened.—The formal opening of the library of the Los Angeles County Medical Association took place, November 27, in the auditorium of the association building. Dr. George Dock, president, made the presentation of the Barlow Medical Library on behalf of the medical library association, and Dr. Philip H. Stephens, president of the county society, the speech of acceptance. Dr. Herbert M. Evans, professor of anatomy and Herzstein professor of biology, University of California Medical School, gave an address, and greetings were offered by Miss Louise Ophuels, vice president of the library association.

DISTRICT OF COLUMBIA

Dr. Fowler Retires as Health Officer.—The retirement of Dr. William C. Fowler, health officer of the District since 1918, will be effective November 24, when he will reach the statutory retirement age of 70. Dr. Fowler graduated from Georgetown University School of Medicine in 1888, and became associated with the health department in 1894 as sanitary officer. From 1906 to 1907 he served as chief medical inspector in charge of the contagious disease service and in 1917 was made assistant health officer. The following year he was appointed health officer. No successor to Dr. Fowler has been announced, but newspapers reported that a reorganization of the department is being contemplated and until this takes place Dr. Edward J. Schwartz will be acting health officer. The committee to study the reorganization will be composed of representatives of the District medical society, the U. S. Public Health Service, and the hospitals of Georgetown and George Washington universities.

FLORIDA

Health at Miami.—Telegraphic reports to the U. S. Department of Commerce from eighty-six cities with a total population of 37 million, for the week ended November 10, indicate that the highest mortality rate (20.3) appears for Miami, and the rate for the group of cities as a whole, 11.1. The mortality rate for Miami for the corresponding period last year was 4.7, and for the group of cities, 10.4. The annual rate for the forty-five weeks of 1934 was 11.3 as against a rate of 10.8 for the corresponding period of the previous year. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

ILLINOIS

Dental Survey.—The state department of health and the Illinois State Dental Society are cooperating in a fall and winter dental health survey of school children. Diet and periodic dental inspections with the aim of preventing tooth decay will be emphasized. In the educational program to coincide with the survey, prenatal care, especially from the standpoint of the diet of prospective mothers, and the diet of children will be particularly stressed in connection with efforts to prevent dental decay. The periodic inspection of teeth and the prompt correction of caries were also emphasized.

Society News.—At a meeting of the Iowa and Illinois Central District Medical Association in Moline, October 31, Dr. Foster Kennedy, New York, discussed "The Interdependence of Neurology, Psychiatry and General Medicine," and Dr. Grandison D. Royston, St. Louis, "The Care of Obstetrical Damage to the Cervix and Pelvic Supports."——Speakers before the Peoria City Medical Society, November 6, were Drs. Clarence Baxter Brown on "Ectopic Pregnancy"; Emil Z. Levitin, "Schizophrenia"; William A. Hinckle, "Anatomical Causes of Proctologic Pathology," and Harry A. Durkin, "Prognostic Consideration of Heart Diseases."

Chicago

American Medical Association Night.—The Chicago Medical Society designated its meeting, November 21, "American Medical Association Night." Speakers were Drs. Walter L. Bierring, Des Moines, Iowa, President of the Association, on "Plans for Economic Security"; William C. Woodward, director, Bureau of Legal Medicine and Legislation, "The Health Insurance Program," and Edward H. Cary, Dallas, Texas, past president, "Some Suggestions Toward Medical Cooperation." A dinner in honor of the guest speakers preceded the meeting. Other officials of the Association were on the reception committee.

Society News.—The Hebrew University Society was recently organized with Dr. Maurice Lewison as president. The purpose of the society is to support the Hebrew University in Palestine, particularly the university hospital and medical center, which is being built on Mount Scopus. Other officers are Drs. Alfred A. Strauss, vice president; Mayer H. Lebensohn, treasurer, and Charles Newberger, secretary. The society is affiliated with the American Jewish Physicians Committee of New York, of which Dr. Nathan O. Ratnoff is president and Dr. Emanuel Libman is chairman of the executive committee.——Dr. Joseph L. Miller will deliver the presidential address at the nineteenth annual meeting of the Institute of Medicine of Chicago, December 4; his subject will be "The Influence of Claude Bernard's Experimental Methods on Medicine."

KANSAS

Birth Registration Campaign.—The Kansas State Board of Health, the federal bureau of the census and the state emergency relief committee are sponsoring a campaign to insure correctness of records and to emphasize legal, social and economic importance of birth registration. Cards will be mailed to every family in Kansas, enclosing birth information, with a request that it be completed for return to the vital statistics department of the state board of health. It is believed that this plan will strengthen the registration of the past year.

Society News.—Dr. Walter L. Bierring, Des Moines, Iowa, President, American Medical Association, will address the Shawnee County Medical Society, December 3.——Dr. Wilfred Cox, Wichita, read a paper on "Dermoid Cysts of the Ovary" before the Sedgwick County Medical Society, October 16.——At a joint meeting of the Clay and Washington county medical societies in Clay Center, October 10, Dr. Edward H. Skinner, Kansas City, Mo., discussed "Preventable and Curable Conditions in the Field of Malignancy."——Dr. Thomas J. Sims Jr., Kansas City, addressed the Wyandotte County Medical Society, November 20, on "Obstetrical Anesthesia and Analgesia." Speakers before the society, October 16, were Drs. Harry R. Wahl and Russell W. Kerr, Kansas City; their subjects were "Primary Carcinoma of Lungs with Marked Mediastinal and Cardiac Extension" and "Extensive Diffuse Carcinoma of the Stomach with Widespread Visceral Metastases." G. Farrell Webb, D.D.S., discussed "Dental Infection as Related to Medicine."

KENTUCKY

State Medical Election.—Dr. Joshua B. Lukins, Louisville, was chosen president-elect of the Kentucky State Medical Association at the annual meeting in Harlan in October, and Dr. Carl C. Howard, Glasgow, was installed as president. Vice presidents elected were Drs. Benjamine F. Robinson, Lexington; Robert L. Collins, Hazard, and Reason T. Layman, Elizabethtown. The next meeting will be held in Louisville.

Society News.—Dr. James W. Bruce addressed the Jefferson County Medical Society, Louisville, November 5, on "Cutaneous Burns." Dr. John J. Moren will speak, November 19, on "Relation of Trauma to Diseases of the Nervous System."——Dr. Adolph O. Pfingst addressed the Louisville Medico-Chirurgical Society, November 9, on "Internal Carotid Cavernous Sinus Aneurysm in Infancy."——Dr. George A. Hendon was the speaker before the Louisville Surgical Society, November 22, on "Mechanical Drainage."——Dr. J. Oliver Knight addressed the Louisville Urological Society, November 27, on "Benign Hypertrophy of the Prostate."——Dr. Milton Smith Lewis, Nashville, Tenn., addressed the Third District Medical Society at Bowling Green, October 17, on treatment of eclampsia.

MASSACHUSETTS

The Dunham Lectures at Harvard.—Dr. Ulrich Friedemann, formerly professor of internal medicine at the University of Berlin and director of the division of infectious diseases at the Virchow Krankenhaus, will deliver three lectures at Harvard Medical School under the Edward K. Dunham Lectureship for the Promotion of the Medical Sciences, December 4, 6 and 11. The first two lectures will be on "Distribution of Dyes, Drugs and Toxins in the Animal Body," and the third on "The Pathogenesis of Diphtheria."

Personal.—Dr. Clifford D. Moore has been named chief executive officer of the Boston Psychopathic Hospital, succeeding the late Dr. Samuel S. Cottrell.——Dr. Lawrence J.

Henderson, professor of biological chemistry, Harvard University Medical School, was awarded the honorary degree of doctor of science by the University of Cambridge, England, October 22.——Dr. C. Macfie Campbell, professor of psychiatry, Harvard University Medical School, Boston, has recently been elected president of the Massachusetts Psychiatric Society; Dr. Charles E. Thompson, Gardner, vice president, and Dr. Oscar J. Raeder, Boston, secretary.——Dr. Walter B. Cannon, George Higginson professor of physiology at Harvard Medical School, has been granted leave of absence from March 15 to Sept. 1, 1935.

MISSISSIPPI

Personal.—Dr. Romeo R. Halfacre, assistant superintendent of the state asylum, Jackson, was recently appointed superintendent of the Ellisville State School by the state board of administration, succeeding Dr. Hugh L. McKinnon, Hattiesburg.——Dr. James T. Googe, Lexington, has been appointed health officer of Copiah County, succeeding Dr. William L. Little, Wesson, who has been conducting the unit on a part time basis. With Dr. Googe's appointment, the unit has been restored to a full time basis.——Dr. James V. May, Port Gibson, has retired from active practice on account of illness. He served as president of the Claiborne County Medical Society for several years.

Graduate Course in Obstetrics.—Clinics and lectures on antepartum and postpartum care will be available for group or individual consultation, beginning January 1, through the state committee on graduate medical education, under the direction of Dr. Maxwell E. Lapham, Philadelphia. The state medical association made the course possible at its meeting in Natchez last May when it appropriated $1,500 and requested the Commonwealth Fund to cooperate financially with the association, the Tulane University of Louisiana School of Medicine and the state board of health. Classes of physicians will be organized in convenient centers to meet for two hours one day a week for eight or ten consecutive weeks. The first centers proposed are Natchez, Centreville, McComb, Columbia and Silver Creek.

NEW HAMPSHIRE

Health Insurance Opposed.—The Merrimack County Medical Society at a meeting in Concord, October 31, recorded its opposition to the adoption of a health insurance plan by the state or national government.

Dr. Bielschowsky Joins Dartmouth.—Dr. Alfred A. Bielschowsky, until recently professor of ophthalmology at the University of Breslau, Germany, has joined the department of research in physiologic optics at Dartmouth Medical School, Hanover, for six months of special work. Dr. Bielschowsky had been associated with the University of Breslau since 1923 and before that had been a member of the faculties of the universities of Marburg and Leipzig.

NEW JERSEY

Personal.—Dr. Martin H. Collier, Camden, was elected president of the eastern section of the American Sanatorium Association at its annual meeting at White Haven, Pa., October 7-8.——Dr. William C. Raughley, Berlin, was honored by the Camden County Medical Society at a meeting in Camden, October 2, in recognition of his fifty years of medical practice. He received a certificate of honor.

Theobald Smith Receives Another Award.—The New Jersey Health and Sanitary Association at its annual dinner, November 16, presented its annual award for meritorious service to Dr. Theobald Smith, director emeritus of the Department of Plant and Animal Pathology, Rockefeller Institute for Medical Research, Princeton. Dr. Smith could not attend the dinner because of illness, and the award, a bronze plaque, was accepted for him by Dr. Carl TenBroeck, present director of the Princeton branch. Mr. James E. Brooks, Newark, made the presentation, reviewing Dr. Smith's career as physician, teacher, student and scientist.

Meeting of Physicians and Pharmacists.—The Bergen County Medical Society met jointly with the Bergen County Pharmaceutical Association in Hackensack, November 13, with the following program: Charles W. Ballard, Ph.D., professor of materia medica, Columbia University College of Pharmacy, New York, "The Physician, the Patient and the Pharmacist"; Dr. Walter S. McClellan, medical director, Saratoga Springs Commission, New York, "Hydrotherapy and Indications for the Use of Natural Carbonated Mineral Waters"; Adolph F. MacQuier, Pharm.M., professor of pharmacy, Rutgers University, "Relationship of the Drug Store to the Physician"; Robert P. Fischelis, Ph.M., Trenton, president of the American Pharmaceutical Association, "Problems Requiring Cooperation of the Allied Medical Professions."

NEW YORK

Diphtheria Campaign.—The departments of health and education of the city of Albany and the Medical Society of the County of Albany are cooperating in a campaign for the inoculation of children against diphtheria. Cooperating physicians have agreed to perform the inoculations for a nominal fee during the campaign, the city to pay for those unable to pay for themselves. The health department has agreed not to administer the treatment until January 1, and both city departments have agreed not to conduct diphtheria clinics in public or parochial schools during the present school year.

Graduate Lectures in Rochester.—The following series of lectures was presented under the auspices of the Medical Society of the State of New York before the Medical Society of the County of Monroe in Rochester, October 22-26:

Dr. Arthur C. DeGraff, New York, Normal Functions of Small Blood Vessels and Alterations Produced by Disease.
Dr. William Goldring, New York, Kidney Function as Affected by Disturbance of Circulation in the Kidney Itself.
Dr. De Graff, Cardiac Function as Affected by Disturbance of Circulation in the Heart Itself.
Dr. Norman Jolliffe, New York, Liver Function as Affected by Disturbance of Circulation in the Liver Itself.
Dr. Clarence de la Chapelle, New York, A Consideration of the Extremities as Affected by Disturbance of Peripheral Circulation.

New York City

Tree Memorial to Madame Curie.—The sixty-seventh birthday of the late Madame Marie Curie, November 7, was observed by the planting of a tree in City Hall Park, with ceremonies in which Mayor La Guardia and Park Commissioner Robert Moses participated. Various French and Polish societies and the consul generals of France and Poland also took part.

Endowment for Long Island College.—The late Mr. Frank L. Babbott, who died in Brooklyn in December 1933, bequeathed a fund of approximately $1,500,000 to the Long Island College of Medicine, Brooklyn, as a special endowment fund, the income from which is to be applied to the furtherance of medical education and research. Mr. Babbott's son, Dr. Frank L. Babbott Jr., is president of the college.

Hospitals' Work Increases.—The United Hospital Fund has published the results of a study of hospital service during the period from 1927 to 1933 showing a heavy increase in the hospital population. The total number of beds increased from 33,535 in 1927 to 41,064 in 1933 and the annual number of patients increased from 549,824 in 1927 to 673,767 in 1933. The largest increase was found in visits to outpatient departments, from 4,183,933 in 1927 to 6,843,025 in 1933. Shifting of patients from voluntary to municipal hospitals was shown by a change in the percentages cared for by the two groups: 65 per cent of the patients were cared for in voluntary hospitals in 1933 as compared with 72.2 per cent in 1927. Another study showing the operating expenses of twenty-seven general hospitals of the fund disclosed that expenditures in the inpatient departments in 1928 were $13,916,538, toward which earnings from patients provided 74.2 per cent; in 1933 the expenses amounted to $12,493,568, with earnings of 61.8 per cent. In 1928, earnings from outpatient departments paid 61.9 per cent of the operating expenses and in 1933 only 54.9 per cent.

Examination for Psychiatrist to Board of Education.—The board of examiners of the New York City Board of Education announces an examination for license as psychiatrist open to men and women applicants for service in the bureau of child guidance. November 30 is the final date for the receipt of applications, which may be obtained at the offices of the board or which will be sent on receipt of a request accompanied by a large stamped, self-addressed envelop. Graduates from recognized medical schools with three years' experience in the practice of psychiatry are eligible; one year must have been spent in institutions for mental disease and two in an organization or clinic for study and treatment of personality and behavior disorders of children. The present age limits for this examination are 35 to 45 years, but the board of education has been asked to lower the limit to 30 years and therefore tentative applications will be received from persons under 35 and over 30. The examination will be in five parts. The first is a thesis of from 7,500 to 10,000 words on the functions and duties of a psychiatrist in maintaining the effective service of a child guidance bureau in a large city school system. Part II is an evaluation of experience, record and personal research studies. Parts III, IV and V will be given only in

New York City subject to the call of the examiners; they include submission of case records, an interview test and a medical examination. The salary will be from $6,000 to $7,000 a year. For information address the Board of Examiners, 500 Park Avenue, New York.

NORTH DAKOTA

Personal.—Dr. and Mrs. Jess H. Moeller, Maddock, were honored recently when 200 friends gathered at their home to observe the twenty-fifth anniversary of their residence in the city; Dr. Moeller was presented with a purse of silver.

Society News.—Dr. Howard K. Gray, Rochester, Minn., addressed the Devils Lake Medical Society in October on "Surgery of the Biliary Tract."——Dr. Rosslyn B. Mitchell, Winnipeg, Manit., addressed the Grand Forks Medical Society, recently, on toxemia in pregnancy.——The North Dakota Anti-Tuberculosis Association celebrated the twenty-fifth anniversary of its founding, October 22.

OHIO

Society News.—Dr. Frank H. Lahey, Boston, addressed the Mahoning County Medical Society, Youngstown, November 20, on "Cancer of the Rectum and Colon."——Speakers at a meeting of the Adams County Medical Society, Manchester, October 17, were Drs. Frederick C. Leeds, Winchester, on "Puerperal Infection"; Wells Teachnor, Columbus, "Cancer of the Rectum and Colon," and Andrew R. Carrigan, Manchester, "Acute Poliomyelitis."——Dr. Hugh Wellmeier addressed the Miami County Medical Society, Piqua, October 12, on "Congenital Syphilitic Conditions in Children."——Dr. Walter G. Stern, Cleveland, lectured on treatment of fractures at a meeting of the Columbiana County Medical Society, Lisbon, October 16.——Dr. Isidor S. Ravdin, Philadelphia, addressed the Stark County Medical Society, Canton, October 9, on acute appendicitis.——Drs. George C. Malley, Parkersburg, W. Va., and Martha Margaret O'Neal, Zanesville, addressed the Muskingum County Academy of Medicine, Zanesville, October 2, on "Intracranial Hemorrhage of the New-Born" and "Pyloric Stenosis in the New-Born," respectively.——Dr. Frederick C. Herrick, Cleveland, addressed the Summit County Medical Society, Akron, November 6, on "Purulent Appendicitis with Rupture of the Appendix."——Dr. Virgil S. Counseller, Rochester, Minn., addressed the Montgomery County Medical Society, Dayton, on "Conservatism in Gynecology," October 19, and Dr. Sumner L. S. Koch, Chicago, November 2, on "Acute Infections of the Hand."——Dr. John Alexander, Ann Arbor, Mich., addressed the Cleveland Academy of Medicine, November 16, on "The Present Status of Chest Surgery."

PENNSYLVANIA

Society News.—The Fayette County Medical Society held its fall clinic November 8, with Drs. Evan W. Meredith, Howard G. Schleiter and John F. McCullough, all of Pittsburgh, conducting surgical, medical and roentgenologic clinics, respectively.——Dr. James A. Cahill Jr., Washington, D. C., addressed the Lackawanna County Medical Society, November 6, on surgical consideration of acute conditions in the abdomen.——Dr. Philip F. Williams, Philadelphia, addressed the Cambria County Medical Society, Johnstown, November 8, on "The Toxemias of Pregnancy."——Dr. Frank H. Lahey, Boston, addressed the Delaware County Medical Society, Chester, November 5, on "Hyperthyroidism and Its Complications with Other Diseases."

Philadelphia

Public Health Night.—The Philadelphia County Medical Society held a "Public Health Night," November 14, with the following speakers: Dr. Henry F. Smyth, assistant professor of industrial hygiene, University of Pennsylvania, "Studies of Philadelphia Air Conditions"; David H. Wenrich of the zoological laboratory, University of Pennsylvania, "Amebiasis and the Carrier," and Franz C. Schnelkes, New York, "Chlorine and the Prevention of Disease."

Wards Named for Hospital Staff Members.—The medical board of the Philadelphia General Hospital announces that several wards will be named for distinguished physicians who have been members of the hospital staff, with dedicatory ceremonies December 4 in the auditorium of the hospital. One building will be named the Sir William Osler Building and the wards will be dedicated to the memory of the following physicians: Drs. Frederick P. Henry, Benjamin Rush, William W. Gerhard, David Hayes Agnew, Horatio C. Wood, C. Lincoln Furbush, Charles K. Mills and J. Chalmers DaCosta.

SOUTH CAROLINA

Malaria Has Increased.—The state department of health recently reported that 800 more cases of malaria had occurred in the state up to the end of September than occurred in the corresponding period of last year. The increase has been noticed especially since July; more than 300 cases per month have been reported. Malaria control work is proceeding slowly because of lack of funds, according to the state health officer, Dr. James A. Hayne, Columbia.

Society News.—Speakers at a meeting of the Tri-County Medical Association (Orangeburg, Bamberg and Calhoun Counties) in Elloree, September 20, were Drs. Samuel E. Harmon, president-elect of the South Carolina Medical Association, on "Modern Economic Problems of the Physician"; Orlando B. Mayer, "Influenza and Pneumonia with Special Reference to Treatment and Use of Oxygen"; George H. Bunch, "Suppurative Pericarditis"; James Richard Allison, "Cancer Information and Propaganda"; Thomas A. Pitts, "Radiation"; William R. Barron, "Prostatic Obstruction." All the speakers are from Columbia.

VIRGINIA

Personal.—Dr. Ernest L. Stebbins has resigned as health officer of Henrico County to join the staff of the New York State Department of Health, Albany.——Dr. William R. Bond, professor of physiology, Medical College of Virginia, Richmond, has been granted a leave of absence for the remainder of the academic year.

Officers of Special Societies.—Several societies that met in conjunction with the Medical Society of Virginia in Alexandria early in October elected officers as follows: Dr. Robert V. Funsten, University, was chosen president and Dr. Bernard H. Kyle, Lynchburg, secretary of the Virginia Orthopedic Association; Drs. William P. McDowell, Norfolk, and W. Ambrose McGee, Richmond, president and secretary, respectively, of the Virginia Pediatric Society; Drs. John H. Neff, University, and Linwood D. Keyser, Roanoke, president and secretary, respectively, of the Virginia Urologic Society.

WISCONSIN

University News.—The regents of the University of Wisconsin, Madison, have appointed a committee to work out plans for using a $450,000 bequest left to the university by Miss Jennie Bowman earlier in this year for the establishment of a cancer institute. Members of the committee are Glenn Frank, LL.D., president of the university; Dr. Charles R. Bardeen, dean of the medical school, and Edwin B. Fred, Ph.D., dean of the graduate school.

Society News.—Drs. Albert C. Broders, Rochester, Minn., and William D. Stovall, Madison, addressed the Winnebago County Medical Society, Oshkosh, October 30, on "Grading of Cancer in Its Relationship to Prognosis and Treatment" and "The State Program for the Control of Cancer," respectively.——Dr. James C. Sargent, Milwaukee, addressed the Dane County Medical Society, Madison, October 9, on "Urinary Tract Stones."——Drs. Eugene S. Knox, Green Bay, and Herman A. Heise, Milwaukee, addressed the Racine County Medical Society, Racine, October 18, on "Gas Gangrene" and "Detention of Alcohol in Body Fluids (Quantitatively) and the Factor of Alcohol in Automobile Accidents," respectively.

GENERAL

Society News.—Dr. Fred M. Hodges, Richmond, Va., was chosen president of the American Roentgen Ray Society at its annual meeting in Pittsburgh, September 25-28, and Dr. George W. Grier, Pittsburgh, was installed as president. Vice presidents elected are Drs. Lyell C. Kinney, San Diego, Calif., and John Sproull, Haverhill, Mass., and the secretary is Dr. Eugene P. Pendergrass, Philadelphia. The next meeting will be held in Atlantic City in September 1935.——Dr. David Riesman, Philadelphia, was named president-elect of the International Postgraduate Medical Assembly of North America at its annual meeting in Philadelphia, November 5-9.——Dr. Thomas J. Collier, Atlanta, Ga., was elected president of the Associated Anesthetists of the United States and Canada at its meeting in Boston, October 18, and Dr. F. Hoeffer McMechan, Rocky River, Ohio, was reelected secretary. The next annual session will be held at Atlantic City, June 10-14.

Registry of Brain Tumors at Yale.—A series of about 2,000 tumors of the central nervous system collected by Dr. Harvey Cushing, now Sterling professor of neurology at Yale University School of Medicine, New Haven, during his service at Johns Hopkins in Baltimore and the Peter Bent Brigham Hospital, Boston, has been installed at Yale. It is

intended that these elaborately catalogued specimens be made useful as far as possible to those interested and it is hoped that the collection will be increased. It is thought that it will be of use to those who encounter rare tumors that they wish to have identified if possible and concerning which they may desire information, particularly on the basis of type prognosis. Any one who may wish to send specimens for diagnosis or may seek information of other sorts is welcome to do so, an announcement states. The following physicians have consented to act as an advisory board:

Dr. Percival Bailey, professor of surgery and neurology, University of Chicago.
Dr. Francis C. Grant, assistant professor of neurological surgery, University of Pennsylvania School of Medicine, Philadelphia.
Dr. Samuel C. Harvey, professor of surgery, Yale University School of Medicine, New Haven.
Dr. George J. Heuer, professor of surgery, Cornell University Medical College, New York.
Dr. Wilder G. Penfield, professor of neurology and neurological surgery, McGill University Faculty of Medicine, Montreal.
Dr. Ernest Sachs, professor of clinical neurological surgery, Washington University School of Medicine, St. Louis.
Dr. William P. Van Wagenen, associate professor of neurological surgery, University of Rochester School of Medicine and Dentistry, Rochester, N. Y.
Dr. Simeon B. Wolbach, Shattuck professor of pathological anatomy, Harvard University Medical School, Boston.

Dr. Louise C. Eisenhardt is curator of the collection.

Changes in Status of Licensure.—The State Board of Medical Examiners of Alabama announces the following action:

Julius G. Henry, Akron, license reinstated, August 21.

At a meeting of the Georgia State Board of Medical Examiners, October 11, the licenses of the following to practice medicine were revoked for violations of the Harrison Narcotic Act:

Dr. Alva H. Weathers, Atlanta.
Dr. William R. Thomas, St. Mary's.
Dr. Loring B. Palmer, Atlanta.
Dr. Luis Balmori, McAdenville, N. C.

At a recent meeting of the Kansas State Board of Registration and Examination, the following action was taken:

Dr. Matthew L. Miller, Coffeyville, license revoked because of conviction on felony charge.
Dr. Christopher C. Kesner, LeRoy, license restored.

The State Board of Health of Missouri recently reported the following action:

Dr. Dawsey Ryan, Bernie, placed on probation for one year, October 26, for excessive use of alcohol.

The Board of Registration in Medicine of Massachusetts reports the following actions:

Dr. Harold Van Gaasbeek, Chicopee Falls, license revoked, July 12, because of his conviction in court as an accessory before and after the fact in an abortion.
Dr. Everett D. Hooper, Boston, license restored, August 30.

The Illinois State Department of Registration and Education reports the following action:

Dr. Gilbert H. Wynekoop, Chicago, license revoked, October 15, because he was adjudged insane.
Dr. Alice Lindsay Wynekoop, Chicago, license suspended, October 15, pending the ultimate disposition of the appeal from the order of conviction in the criminal court of Cook County, the suspension to become a revocation in the event that the order of conviction is affirmed. Dr. Wynekoop was sentenced to prison following her conviction of murder.
Dr. John A. Newhouse, Caledon East, Ont., license revoked, October 11, for narcotic violation.
Dr. Archibald L. Calvin, Chicago, license revoked, October 11, following his conviction of manslaughter.

The Indiana State Board of Medical Registration and Examination reports the following action taken in October:

Dr. William Hamlin Curtiss, San Diego, Calif., license revoked for violation of the Harrison Narcotic Act.
Dr. Ralph K. Brown, New Albany, license revoked for violation of the Harrison Narcotic Act. Dr. Brown was recently sentenced to Fort Leavenworth.

The Texas State Board of Medical Examiners has reported the following revocations of licenses during the past year:

Richard L. Smith, Waco; Gustav R. Gerson, League City; John C. Hudson, Cedar Hill, and James L. Rountree, Argo, for narcotic addiction.
W. D. Yeary, Dallas, for violation of five year suspension of license.
Edgar M. Hughes, Truscott, because of commitment to a hospital for mental disease.

The New Jersey Board of Medical Examiners, at a meeting September 19, took the following action:

Dr. Charles F. Baxter, Paterson, license revoked for conviction of a crime involving moral turpitude; namely, obtaining money under false pretenses.

Annual Report of Red Cross.—Physical handicaps and health defects affecting 240,000 children were treated and corrected through the activities of the American Red Cross in 1933, according to the annual report, issued October 27. The report shows that 770 public health nurses made more than a million nursing visits to 154,000 patients, nearly 20 per cent of whom were maternity cases. Several hundred more nurses were engaged in teaching home hygiene and care of the sick to 62,000 students during the year. The nursing service furnished nurses for epidemics of typhoid and malaria and in several disasters, notably the Los Angeles floods and the Texas hurricane. The food and nutrition service reached more than 7,000 students during the year, families affected by unemployment being especially aided through instruction in food selection. Two special funds were administered, one of $25,000 given by Will Rogers for public health work and one of $15,000 given by Scottish Rite Masons for giving employment to "white collar" workers.

CANADA

Hospital News.—Hospitals and clinics in greater Winnipeg have recently agreed that no patient will be admitted to their outpatient departments for consultation or treatment except on the production of a letter from a private practitioner.—— Dr. Ernest C. Menzies, Montreal, has been appointed superintendent of the provincial hospital at Fairville, New Brunswick, succeeding Dr. James V. Anglin, retired.

Personal.—Dr. Murray Maclaren, St. John, N. B., entertained the St. John Medical Society at a dinner at the Riverside Country Club, August 18, in celebration of the fiftieth anniversary of his graduation from the University of Edinburgh Faculty of Medicine. The society presented a silver tray to Dr. Maclaren.——Dr. Reginald O. Davison, director of the division of communicable diseases in the Saskatchewan Department of Health since 1922, has been appointed deputy minister of health for the province.

Society News.—Dr. Lorimer J. Austin, professor of surgery, Queens University Faculty of Medicine, Kingston, Ont., addressed the St. John Medical Society, September 14, on carcinoma of the colon.——Dr. George W. Rogers, Dauphin, was elected president of the Manitoba Medical Association at the annual meeting at Winnipeg in September. A feature of the meeting was a symposium on "Upper Right Abdominal Pain," presented by Drs. Donald C. Balfour and Byrl R. Kirklin, Rochester, Minn.; Charles H. Hunter and Brandur J. Brandson, Winnipeg, and Lewis J. Carter, Brandon. Dr. Louis B. Wilson, Rochester, Minn., made an address at a dinner sponsored by the Medical Alumni Association on "Present-Day Defects in Medical Education."—— Dr. Hugh H. Christie, Esterhazy, was elected president of the Saskatchewan Medical Association at the recent annual meeting; Dr. George H. Lee, Shaunavon, honorary president.

Government Services

Surgeon General Cruises with Fleet

Rear Admiral Perceval S. Rossiter, surgeon general of the U. S. Navy, sailed from Norfolk on the U. S. S. *Langley*, October 12, to join the fleet at Guantanamo Bay, Cuba. According to the *Military Surgeon*, this is the first time a surgeon general of the navy has made an extended cruise with the fleet and observed medical department activities afloat at close range. Surgeon General Rossiter's trip included a cruise on the flagship of Admiral Joseph M. Reeves during exercises in West Indian waters and the Caribbean. He transferred to the hospital ship, the U. S. S. *Relief*, in the Canal Zone, on which he completed the voyage to the West Coast. He will inspect all naval medical departments on the West Coast before he returns to Washington, D. C., about the first of the year.

Selling Fraudulent "Warm Springs" Crystals

W. C. Dunham, Macon, Ga., has been sentenced to a year in the penitentiary and two of his associates are awaiting trial on a charge of conspiring to violate the federal Food and Drugs Act by advertising and selling "Warm Springs Crystal Compound" as coming from Warm Springs, Ga. The company and its so-called crystals, which were found to be Glauber's salt, were disavowed in the beginning by the Warm Springs Foundation as having no connection with the springs except that the office was set up in the town. When the "crystals" began to appear in interstate commerce, members of the company were indicted by a grand jury. It was reported that the salt was bought at 2 cents a pound and sold for $1.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 27, 1934.

Examination of the Eyes of Air Pilots

The air ministry has issued revised regulations for medical examination of fitness for flying. Those for eye examination are of interest. The standard of visual acuity, without correcting glasses, is 6/6 distant vision in each eye. But the eye specialist may at his discretion recommend acceptance when the acuity is 6/9 (for short service commissions 6/12) provided it is correctable to 6/6 in each eye. For private flying and for navigators a certain allowance is made and correcting glasses are allowed to be worn, provided a degree of acuity can be attained, with or without glasses, equal to at least 80 per cent of the normal visual acuity for each eye taken separately, or 90 per cent for one eye and 70 per cent for the other. No candidate, generally speaking, will be passed who shows a manifest hypermetropia of 2 diopters or over. The reason for this is that the continued effort to focus on the retina is apt to induce a tonic action of the ciliary muscle and also of the internal recti. This tonic action produces errors of judgment of distance in flying. In addition, under the effects of high altitude loss of accommodation is liable to occur, so that a pilot cannot see his instruments and will be liable to make a bad landing.

Great importance is attached to muscle balance and visual judgment, as these play a greater part in accurate flying than visual acuity. It has been proved that lack of true ocular muscle balance is the most common cause of error in judgment in landing. Exophoric pilots tend to flatten out their aircraft too early, because they judge the ground to be nearer than it is, while esophoric pilots tend to fly into the ground. In addition to these there are "bad landers" from defective neuromuscular coordination. A test for muscular balance favored by the British air ministry is the Bishop-Harman adjustable diaphragm, which enables the field of vision of one eye to be separated entirely or partially from that of the other. The capacity to maintain an even ocular muscle balance (and therefore binocular vision) under increasing difficulty produced by progressively diminishing the overlap of the visual fields is thus tested. Both eyes must have good visual fields as tested by hand movements. Color vision must be normal, as in landing at night colored lights are used as signals.

Crossing Places for Pedestrians

The latest measure for the prevention of road accidents—the provision of marked crossing places for pedestrians—has been described in a previous letter. New regulations have been issued concerning them. There is no compulsion of the pedestrian to cross at the indicated places, but pedestrians who remain on a crossing longer than is necessary will be liable to a fine of $10. The general effect of the new regulations is that at crossings where the traffic is controlled by police or automatic signals the pedestrian has the absolute right of way only when the traffic has been stopped by the policeman's hand or the signal light. At crossings not so controlled he has the right of way at all times and the traffic must give way to him. But he must go straight across and so hinder the traffic as little as possible. Vehicles must not stand on a crossing. The driver of every vehicle approaching a crossing must, unless he can see that there is no pedestrian thereon, proceed at such a speed that he can stop if necessary before reaching the crossing. Every pedestrian on the crossing shall have precedence of him. The Pedestrian's Association is not satisfied on one point. The minister of transport has not implemented his undertaking that a driver shall be required to give way to a pedestrian who, while on the footpath, indicates his intention to cross. It is urged that as a consequence a pedestrian will not be able to exercise his right to cross where there is a continuous stream of vehicular traffic but will have to wait indefinitely. Another innovation is the indicating of the crossing places (which are already marked on the ground) by yellow globes on poles about 7 feet high. Under the light of the lamps at night these globes show up. They were introduced because of difficulty in seeing the crossing places at night. They have been erected at distances of every few hundred yards in the London streets and though they must be useful are something of a disfigurement.

The Medical Training of South African Natives

The number of European physicians in South Africa is quite insufficient for the needs of the natives and the problem of training native physicians has arisen. The Witwaterstrand University of South Africa does not provide higher education for natives, and those willing and able to pay for it have to go overseas to British schools. But the university has laid down conditions under which it would be willing to train natives. In view of the strong prejudice of the European community, non-European students cannot be admitted to the existing medical classes but must be taught in separate classes. But it is laid down that the same training should be given and the same standard demanded as for European students. As the finances of the university could not support the additional burden entailed by the establishment of classes for non-European students, provision should be made by the government for the additional cost, including buildings and equipment as well as recurrent expenses.

PARIS

(From Our Regular Correspondent)

Nov. 5, 1934.

French Urological Congress

The French Urologic Congress held its annual session in Paris in October. Dr. Chauvin of Marseilles, who had been appointed at the preceding annual meeting to read a paper on a specially chosen subject, gave an exhaustive review of inflammations of the testis and epidydimis, exclusive of tuberculosis and syphilis. The first part of the paper took up the chronic forms of gonorrheal epididymitis, which are difficult to distinguish from other forms of chronic inflammatory enlargement of this structure, especially tuberculosis. The suppurating form of gonorrheal epididymitis is more frequently encountered. If the gonorrheal infection is latent, the differential diagnosis between an epididymitis due to the gonococcus from one due to tuberculosis or to the ordinary pyogenic organisms may be very difficult.

The second part of the report was devoted to the nonspecific forms of orchiepididymitis, which received little attention until toward the close of the last century. There is often a history of gonorrheal infection or of an injury. The organisms most commonly found are the colon bacillus and the various types of staphylococci, and they may be secondary to similar infections (generalized or localized) elsewhere in the body. Such localizations, however, more commonly involve the testis than the epididymis and hence the most probable mode of invasion of the latter structure is canalicular; that is, by way of the lumen of the vas deferens from infections of the prostate, seminal vesicles or a latent urethritis. The route of infection may also, but much less commonly, take place by way of the lymphatics of the vas, rarely by way of the veins. One sees clinically these nonspecific epididymitis cases in acute or nodular or suppurative or fibrous indurative form. The clinical picture resembles closely that due to the so-called specific forms. The B. coli

type involves the entire epididymis and hence may simulate a gonorrheal or tuberculous infection. Those due to the staphylococci occur in younger persons and are characterized by a less acute onset, less of a tendency to be bilateral but subject to frequent acute exacerbations.

The diagnosis of the various "nonspecific" forms depends on a search for other organisms than the gonococcus and tubercle bacillus. In the acute, the treatment is the same as in acute "specific" cases. In the chronic type, foci of infection must be eliminated in the urethra, prostate and seminal vesicles. Surgical intervention may be called for if fistulas persist or there are frequent acute exacerbations. Such operations as simple incision or removal of the epididymitis usually suffice. Castration is seldom indicated.

Pay Patients in Charity Hospitals

The medical profession of France has protested to the authorities regarding the large number of patients able to pay who receive free treatment in the dispensaries and wards of public hospitals. In the city of Paris alone there are about 35,000 beds available for the treatment of free patients, all under the direction of a central organization, the Assistance publique. The director of the latter has given instructions that in the future every applicant must sign a statement of his financial condition in order to exclude from free services those who are able to pay a physician in private practice. A recent writer in the *Concours médical* does not believe that such an exclusion of pay patients will ever be conscientiously carried out, because the budget of the free hospitals is in such a state that only about half of the money needed for maintenance is given by the local governments or received from legacies. Two solutions present themselves in the future. First, that only patients be received in the hospitals who cannot pay at all, and that additional structures be erected in connection with charity hospitals, where pay patients can be treated by the same medical staffs. This has been already carried out at Nancy, in eastern France. Second, that the entire medical personnel be given full time positions, with sufficiently adequate remuneration to enable them to forego the wish to treat private patients outside the hospital.

Madame Curie

In the September 22 issue of the *Presse médicale* appeared an account of the achievements of Madame Curie, by Professor Roussy, director of the Cancer Hospital of the University of Paris. Born in 1867 in Poland, Miss Sklodowska began her studies in France in 1894 and married Pierre Curie, a young physicist, the following year.

The first investigator to describe radioactivity of certain uranium salts and of the element itself was Henri Becquerel, in February 1896. Madame Curie, who was working independently in the laboratory of Professor Lippman, made her first communication in April 1898, before the Academy of Science, in which a new method, using electricity, was described, of demonstrating radioactivity in two minerals, pitchblende (uranium oxide) and chalcolite (double phosphate of copper and uranyl) as being much more marked than in uranium itself.

Pierre Curie associated himself with the work of Mme. Curie and on July 18, 1898, they announced the existence of a new radioactive substance contained in pitchblende. They suggested that the new metal be called polonium, in honor of Mme. Curie's natal country. Finally, Dec. 26, 1898, the discovery of radium was announced under the title "a new radioactive substance found in pitchblende." Three years later, Pierre Curie and Henri Becquerel read a paper on the physiologic action of radium emanations, and soon after some of the element was employed at one of the public hospitals of Paris in the treatment of cancer.

Mme. Curie and her husband received recognition in the form of the Nobel prize in physics and later in chemistry. Fellowship in the Academy of Science was bestowed on Mme. Curie after the death of her husband. Her daughter and son-in-law (Dr. Jolliot) were associated with Mme. Curie in her research work and they will shortly announce the discovery of a method of preparing radium in the laboratory.

She continued her work until failing health compelled her to abandon it.

Burns of the Anterior Segment of the Eye

Prof. F. Terrien, at one of his clinics, called attention to certain features of burns by steam and by acid. To detect minute lesions of the cornea, which are invisible on examination even with the aid of a magnifying lens, Terrien employs a 1 per cent solution of fluorescein. After the instillation of one or two drops, the areas that have been denuded of their epithelial covering appear as greenish spots. In the first case this test revealed an extensive superficial burn of the cornea, which healed without loss of vision following the use of lavages, application of 1 per cent iodoform ointment and instillations of atropine. Burns due to steam can be considered as the least serious of all burns of the eye. In the second case, cement had been the cause of the burn. Although there had been corneal ulceration, treatment by hot applications and lavages had effected almost complete recovery.

In the fourth case the burn followed an explosion during the preparation of sulphuric acid and involved the eyelids, cornea and conjunctiva. In such cases the prognosis should be guarded so far as the cornea is concerned. Although apparently not involved primarily, it may become opaque as the result of secondary changes.

As an eye wash to be employed in large quantities, Terrien prefers a 1.4 per cent saline solution followed by a 1 per cent iodoform or mild silver protein salve to prevent the formation of a symblepharon. Burns due to lime are the most to be feared because here there are two factors, the heat generated by the lime and its chemical action.

BERLIN

(From Our Regular Correspondent)

Oct. 1, 1934.

Difficulties Encountered in Combating Venereal Diseases

The German Society for Combating Venereal Diseases instituted an inquiry among the physicians and hospitals concerning the management of venereal patients. The replies received indicate that in about half of the cases the treatment of persons of restricted means is inadequate. While a research is being made for the proper society to shoulder the burden of the expense, valuable days and weeks are often lost, particularly in the rural communities. In the case of persons who are insured indirectly through the head of the family, in which event the krankenkassen bear only half of the expense for medicines, a delay often arises, if the patients are without means, before the other half of the cost of medicines can be guaranteed. In like cases an interruption of treatment may occur or the treatment may even be discontinued entirely. A similar situation arises when private insurance companies declare in their policies that no compensation will be paid for venereal diseases or when the granting of aid under such conditions is left to the discretion of the advisory board. Sometimes the public welfare department advance patients funds on condition that they shall be repaid within a certain time, and if the patient has any mortgageable property they may demand a mortgage to insure prompt repayment of such obligations. In some cases, parents are asked to guarantee the repayment of funds advanced for medical care of their children. As the examples just mentioned

The Pedestrian's Association is not satisfied on one point. The

closely that due to the so-called specific forms. The B. coli

show, hospitals and departments of public welfare do not preserve as they should the rights of privileged communication. It thus happens that nearly all women patients of a physician who records the actual diagnosis on the sickness certificate lose their positions. Many patients are deterred from applying for treatment, as they often must sit for hours in crowded policlinics beside morally depraved persons of both sexes. Another subject of frequent complaint is the unsatisfactory low fee allowed for treatments. A specialist often receives only from 12 to 20 cents for a treatment. A physician is held accountable if he demands higher fees than those established. In the replies to the questionnaire many physicians emphasized that the medicines needed for thorough treatment cost from two to four times the amount of the fees allowed. Many consultation centers state that practicing physicians refuse to cooperate with them. The reporting of negligent patients and the detection of sources of infection are carried out in a lax manner. Hence, Professor Spiethoff, of the University of Jena and the head of the German Society for the Combating of Venereal Diseases, has made a special appeal to the German physicians in which he emphasizes their duties in the matter of ferreting out sources of infection. The hospitals report that the number of hospital patients declines from year to year, not as a result of the decrease in gonorrhea but because of the difficulty encountered in being registered in the hospital under the auspices of the sick insurance institutions and public welfare offices. Hospital treatment may in various cases be prematurely canceled at the request of just such expense bearers. Many sick insurance companies grant, on principle, a period of hospitalization of only fourteen days. Patients with gonorrhea are sent to the hospital only in the event of serious complications. If the organizations defraying such expenses grant a period of hospitalization to a patient, they generally favor those hospitals with the lowest standards of treatment, where no special departments are to be found. Admittance was frequently refused to especially dangerous patients, such as prostitutes and concubines, on grounds of false economy. According to reports, it is believed that the hospital treatment of prostitutes may be done away with by enforcing sexual restraint on them. In the light of all this, it is of prime necessity that extensive treatment of venereal diseases be guaranteed by legal and organized measures. The state must find ways and means of forcing unapprehensive persons to fulfil their duties. Larger and broader demands must be made of the physicians' organizations.

It may be said with respect to prostitution that an artificially increased supply results in an artificially increased demand. In many large cities, attempts have been made again to confine prostitutes to designated houses and streets (which for years has been legally contested). The disadvantages of such confinement are not questioned. Only one tenth of the prostitutes are known to the authorities, and only a small number of these women can be provided for in brothels. Consequently this confinement has no influence on the disadvantages and dangers attendant on the widely scattered separate domicile of prostitutes. On the other hand, the streets frequented by the girls become centers of attraction for corruption, vice and perversion. Even the most conscientious medical examination is of no avail, because of frequent and promiscuous intercourse. Finally, such confinement is conducive to organized vice and prostitution. If prostitutes are segregated in secluded houses, if they choose their own dwelling or seek night quarters which to all appearances are inconspicuous, it may be regarded as a lesser evil. Despite quiet tolerance of such quarters in the streets frequented by prostitutes, the police are liable to interfere at any time.

Members of Krankenkassen and Number of Patients Treated

Recently a report was made on sickness insurance for the year 1933. Now the reports for the first six months of 1934 have been given out. The number of krankenkassen, as a result of merger, has notably diminished and the number of krankenkassen members has risen so that the tendencies displayed by the 1933 report have been continued. The membership increase in the federal insurance companies as in the auxiliary insurance organization, comprising both obligatorily insured and voluntarily insured persons, may be observed in table 1.

TABLE 1.—*Increase in Membership of Federal Insurance Companies*

End of Month	Number of Members (Thousands) 1933	Number of Members (Thousands) 1934	Increase per Thousand in 1934 Corresponding Month of Preceding Year
January	17,539	18,907	314
February	17,651	19,171	264
March	17,940	19,444	273
April	18,170	19,948	503
May	18,516	20,158	210
June	18,616	20,163	5

The slight increase in June is based on certain mathematical facts. The increase in insured from the beginning of 1934 to the end of June 1934 amounted to 1,570,000, and from the latter date to the beginning of 1933 amounted to 2,624,000. This increase is closely connected with the decrease in unemployment; here it must be kept in mind that not all the newly employed have also been obligatorily insured (e. g., because the salaries are too large to require this). Others have been able to evade compulsory insurance on similar grounds.

TABLE 2.—*Distribution of Members*

Type of Organization	Number of Kassen in Each Organization	Approximate Number of Members (Thousands)	Number of Compulsory Insured, June 30, 1934 (Thousands)
Municipal krankenkassen	1,892	12,345	10,100
Rural krankenkassen	423	1,876	1,668
Factory krankenkassen	3,354	3,044	2,697
Guild krankenkassen	726	545	476
Miner's krankenkassen	17	564	555
Total number of krankenkassen recognized by federal law	6,412	18,374	15,496
Auxiliary (private) krankenkassen	47	1,790	1,426
Total	6,459	20,164	16,922

The distribution of members among the various krankenkassen and the distribution of compulsorily insured and voluntarily insured by June 30, 1934, is given in table 2.

TABLE 3.—*Treatment During 1934*

Month	Sick	Total	Percentage Men	Percentage Women
January	562,947	3	2.7	3.6
February	540,384	2.8	2.4	3.5
March	488,656	2.5	2.2	3.2
April	471,475	2.4	2	3
May	465,553	2.3	2	2.9
June	486,828	2.4	2.1	3
Average	502,640	2.56	2.23	3.2

Of 18,373,980 members of kassen recognized by federal law, June 30, 1934, 11,930,996 were men and 6,442,984 were women. The number of patients treated ("unemployable ill and puerperal women"), as measured by the sum total of insured for the year 1933, shows an average of 2.7; this means that 2.7 out of every 100 insured receive treatment. In table 3 is given the development in 1934.

The already considerable decline of the number of sick demonstrated even further improvement in the year 1934. The numbers are generally higher for women than for men. The average for cases of absolute illness for the first six months of 1934 is likewise lower than the 1933 average. The municipal krankenkassen have the highest incidence of cases, in accordance with the size of their membership. The danger of illness is, as can be seen from the numbers, greatest in mining.

BUCHAREST

(From Our Regular Correspondent)

Oct. 1, 1934.

History of the Rumanian Faculty of Medicine

The Rumanian Medical Academy offered prizes for the best treatises on the history of the faculty of medicine in Rumania. Two were awarded prizes. It appears that the first medical school in Valachia, a province of Rumania, was founded ninety-three years ago. There were physicians practicing in Rumania prior to 1840, but they were foreigners: Italians, Germans and Greeks. There was among them also a Rumanian, Cretulescu, who felt the necessity of trained assistants who could help physicians in hygienic work, so he planned for a small surgical school at the Coltea Hospital. The hospital accepted his proposal and the surgical school was opened Sept. 21, 1841. There being no books, Cretulescu edited a book from which the apprentices could learn anatomy and physiology. Three hundred copies were distributed free among the students. March 3, 1843, Dr. Cretulescu appealed to the hospital board to place the whole Coltea Hospital at his disposal in order to establish a clinic for students. The board rejected this proposal, whereupon Cretulescu resigned and the school was taken over by Drs. Vartiade and Risdofer. The first graduates with diplomas left the school by the end of 1843. Then the school was closed, to be reopened May 2, 1852. The school was reopened in a much better condition as regards teachers and equipment, but it did not last longer than two months, for another school was established in the Mihai Voda palace, where the state archives were displaced.

About this time there came to Rumania a man of Italian descent, Carol Davila, but brought up and educated in France. He founded in the Mihai Voda palace the "small surgical school," and appealed to Prince Stirbey for permission to annex this school to the military hospital, which at this time was located in the building. The first professors in the school year of 1855-1856 were Davila, Poliuzu, Barasch and Suhamel. In 1857, Davila had his pupils do anatomic dissections, of course secretly, in a barn, for such work was not compatible with the morals of the times. Dobrescu, a surgeon of Targoviste, narrated to many people, the following story, stating that he heard it from his father: A Gipsy woman came to the military hospital of Mihai Voda requesting the corpse of her son in order to bury him. By accident she stepped into the dissecting room, where Professor Davila was giving demonstrations on the cadaver of her son. She recognized the corpse and started such a shouting that the whole community became alarmed and Professor Davila and his pupils had to leave town to escape lynching. When the minister of war, Colonel Odobescu heard of this he immediately closed the medical school. Davila hastened to the French consul general, Beclard, and made a detailed report. The consul commanded Davila to reopen his school at once but henceforth to conduct it under the auspices of France. The patriotic Davila went to the prince and informed him what had happened. The prince considered the decree of the consul an offense and ordered Davila to open his medical school under the auspices of Rumania.

In 1858 the French ministry of public instruction issued a decree, which declared the Bucharest medical school to be equivalent to the French medical and pharmaceutic school and at the same time the ministry permitted Bucharest senior students to complete their studies in France. The modest medical school became in 1869 a faculty of medicine. In 1860 the Mihai Voda palace proved inadequate and the faculty was moved to the military hospital in Stirbey Voda Street. In 1869 a building for the faculty was constructed in the boulevard, where it remained until 1901, when is was replaced by the modern well equipped Cotroceni building.

The Bucharest pathologic and bacteriologic institutes were opened, Aug. 12, 1887, the first under the management of Dr. Victor Babes, late lecturer to the Budapest University, for many years assistant to Professor Högyes. The object in establishing this institute was to conduct a campaign against epidemic diseases and rabies.

Another university with a medical faculty was established in 1890 in Jassy, the capital of Moldova, and with the annexation of Transylvania the country gained a third faculty of medicine, that of the University of Cluj, the capital of Transylvania. There is a fourth university in the country in Czernowitz, capital of Bucovina, without a faculty of medicine. It is the intention of the government shortly to erect here buildings for a faculty of medicine.

Pharmaceutic Firm Peddles Advertising Leaflets

One effect of the boycott of German goods has been that a large pharmaceutic firm descended from the pedestal of good taste and commenced house to house peddling with leaflets strongly recommending the use of a diuretic, one of its products. The firm is the Bayer firm, known as "Bayer-Meister-Lucius," I. G. Farbenfabrikenindustrie Aktiengesellschaft, Leverkusen a/Rh., Germany. The representative of the firm distributed leaflets (printed in German) to every house.

The Campaign in Bessarabia Against Typhus Exanthematicus

In Bessarabia, a province of Rumania, numerous cases of typhus exanthematicus have occurred in recent years, fortunately with but slight mortality. The government sent a special commission to Bessarabia to fight the scourge. Since March of this year, 245,000 persons have been deloused and individually disinfected, and 240 villages have been subjected to house to house disinfestation. The special commission in one county (Lapusna) opened ten public baths. Formally, 90 per cent of the Bessarabian villages were infested with lice. The campaign has been so efficacious that last week only two cases of typhus exanthematicus occurred in the region of Chisenew.

MEXICO

(From Our Regular Correspondent)

Oct. 29, 1934.

Reorganization of Public Health Service

The members of the federal department of public health in Mexico have recently organized the so-called unidad médico-sanitaria cooperativa. The departments of inspection of immigrants, the campaign against prostitution, prevention of epidemics, the control and supervision of food, the water supply and the sewage services, which heretofore have been independent departments, now will cooperate as a unit under direct control of the department of public health of the capital of the state. The central department at the capital of the state has branches and connections with each given field in the state, so as to cover all cities, towns, villages, ports and ranches, and direct contact and advice from the central federal department of public health. The units are already functioning in Veracruz and Cuernavaca, are being organized in Nuevo León, Puebla, Guanajuato, Jalisco and Querétaro, and are being planned in Sonora, Sinaloa, Hidalgo and Morelos. A health unit in the department of irrigation, has been established in Anáhuac, an

liable to interfere at any time.

the development in 1934.

important agricultural city in Nuevo León. Attention has also been given to the sanitary condition of places frequented by tourists, with an aim to prevent disease, especially various important places on the international highway that will connect Mexico City with the United States and which is now under construction. A sanitary brigade was recently sent to Tamazunchale to give smallpox and typhoid vaccination to the inhabitants and also to ascertain whether or not the conditions of the city meet the requirements for the establishment of a health unit in it. Tamazunchale is a city of importance on the international highway, in its passage through San Luis Potosí. The coordination of the health services represent preliminary steps for the establishment of the Mexican Plan Sexenal, according to which public health will greatly improve during the six year period of President Cardenas's administration, which will start December 1.

Modernization of Mexican Hospitals

The public, private, municipal and governmental hospitals in Mexico City have recently improved. The hospital Casa de la Beneficencia Española, a property of the Sociedad Española de Beneficencia, which was located on San Juan de Letrán Street, recently moved to a new location in the modern suburban town Chapultepec Heights. It now meets all the requirements that science demands of modern hospitals. The old site was donated to the city for the extension of a boulevard, now in construction, from the city to Los Alamos, a suburb.

The Hospital Francés, a hospital for private patients, has doubled its number of beds and has a new chapel for religious services for patients and their relatives. The new furniture and equipment are of the best type.

The Mexican Red Cross Emergency Hospital, for the care of persons injured in accidents, has moved to its own new building at the corner of Monterrey and Durango streets. The the new building, the furniture and equipment are modern.

The government of the city supports also a department with services for the immediate treatment of persons injured in accidents and other emergencies. This department is known as the Hospital of Emergencies of the Green Cross. Up to recently its functions were limited to the performance of emergency operations and the administration of first aid. The Hospital of Emergencies of the Green Cross recently was radically renovated by the establishment of a new central station and of small outlying stations covering all parts of the city. Each station has a suitable building with waiting and resting rooms and medical and surgical wards, also an ambulance service, and physicians and nurses who work in turns so as to provide twenty-four hour service. These improvements have resulted in saving the lives of many of the injured.

Reunion of Texas Internists in Mexico City

The members of the Texas Club of Internal Medicine, under the chairmanship of Dr. Kopescki, held their annual reunion in Mexico City, September 17-21. The program was organized by the members of the Sociedad Mexicana de Medicina Interna, who received their Texas colleagues as their hosts. The papers presented by members of the Sociedad Mexicana de Medicina Interna were written in English and discussed by the members of both societies. Some of the topics discussed were cancer of the esophagus, the clinical and roentgen picture of silicosis in Mexico, the treatment of tuberculosis in Mexico, pseudocancer of amebic origin, the first book on physiology published in America, biliary lithiasis, a comparative study of cardiac teleradiography and orthodiagraphy, lymphoid leukemia, immune serum in exanthematous typhus, a new method of pyretotherapy, schizophrenia and physical therapy. The program included visits to the Hospital General, Hospital Juárez, Manicomio General of Mixcoac, the Instituto de Higiene of Popotla, the School of Medicine, the public health department and some other places of medical interest. Scientific meetings were held at the Hospital General, various well equipped departments of which, especially those devoted to medical education, were shown to the visitors. The equipment of this hospital for the teaching of cardiology, with apparatus for collective auscultation, and that for the teaching of urology, deserve especial mention. The Texas physicians were invited to a special meeting of the Sociedad Mexicana de Medicina Interna and to a meeting of the Academia Nacional de Medicina of Mexico, held in their respective headquarters, in honor of the visitors. A banquet presented by the Mexican physicians to the Americans, which was characterized by great cordiality, ended the reunion, during which the fraternal relations and better understanding of the American and Mexican physicians were emphasized. English was spoken in all receptions given to the visitors.

Meeting of Surgeons

Mexican surgeons will meet in a general reunion, November 18-24, at the Hospital Juárez, a surgical center of renown. The reunion was organized by the members of the Sociedad de Cirugía del Hospital Juárez, under the auspices of the members of the Office of Public Welfare of the Federal District. Some departments of the hospital, which have been recently improved or remodeled with the resources of the public welfare department, will open with inaugural ceremonies during the days of the reunion. The scientific program will be of interest. There will be an exposition of surgical instruments and apparatus made by Mexican physicians and surgeons.

Marriages

SYLVESTER W. RENNIE, Wilmington, Del., to Miss Margaret Carolyn Valentine of St. Louis in New York, September 29.

BERKELEY HANCOCK MARTIN to Miss Elizabeth Sydnor McCraw, both of Richmond, Va., September 29.

EUGENE BYRON GLENN, Asheville, N. C., to Miss Virginia Grace Mason of Birmingham, Ala., November 3.

THOMAS EDGAR PAINTER, Williamsburg, Va., to Miss Frances Angelina Curtis of Liberty, N. C., October 15.

DUNCAN SHAW OWEN, Fayetteville, N. C., to Miss Mary Gwyn Hickerson of Lenoir, in October.

JOSEPH LINN HETZEL to Miss Margaret Spencer de Lancey, both of Waterbury, Conn., October 12.

CHARLES DEXTER LUFKIN, Northfield, Minn., to Miss Ann E. Gwynne of Windber, Pa., recently.

CHARLES LORRAINE CABELL to Miss Elizabeth DeVega Danford, both of Richmond, Va., July 28.

JOSEPH STANLEY FAULKNER, Hazard, Ky., to Miss May Drew Hendren of Danville, recently.

WILLIAM LOUIS WOOLFOLK, Owensboro, Ky., to Miss Julia Porter of Paris, Tenn., October 20.

CLARENCE S. THOMAS to Miss Mary Elizabeth Keller, both of Nashville, Tenn., November 3.

ARTHUR E. MORGAN to Miss Frances Mauney, both of Lincolnton, N. C., October 25.

DAVID HENRY POER to Miss Margaret Underwood, both of Atlanta, Ga., October 30.

JOHN EDWARD SHORT to Miss Catherine Julie Connelly, both of Los Angeles, October 9.

ALONZO NEWTON BAKER to Miss Esther McLaren, both of Marion, Ill., October 25.

GEORGE HAMMOND to Miss Marian Davis, both of Ann Arbor, Mich., October 1.

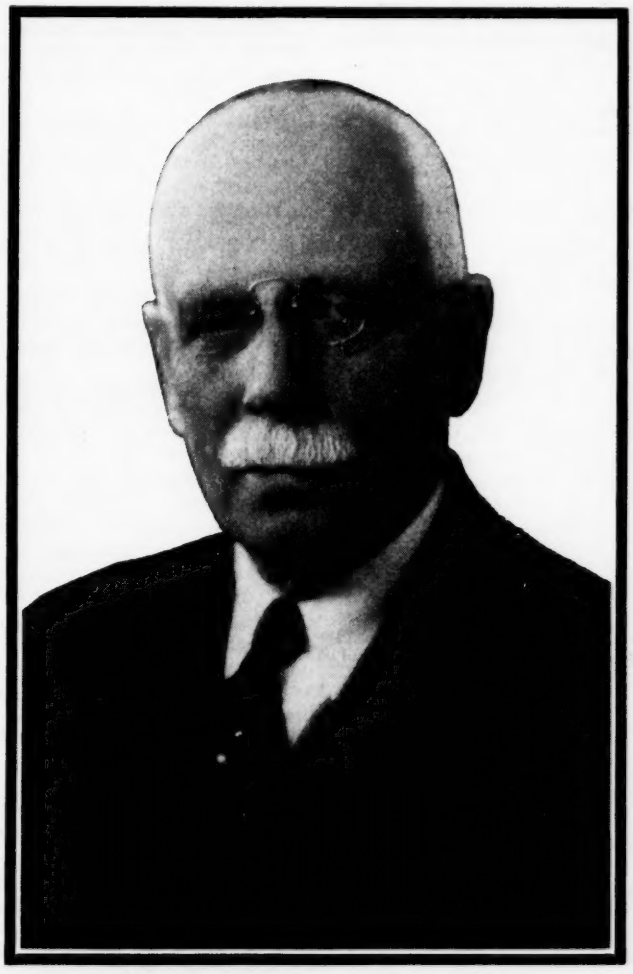
EMANUEL J. RICHTER to Miss Amy Maret, both of New York, in August.

JAMES LEE PITTMAN to Miss Clare Jones, both of Atlanta, Ga., October 16.

BOOKER LEE to Miss Nellie Estelle Lindsay, both of Pulaski, Va., in June.

Deaths

Wendell Christopher Phillips ✠ President of the American Medical Association in 1926-1927, died at his home in New York, November 16, aged 77. Dr. Phillips was born in Hammond, N. Y., June 9, 1857. After attendance at Potsdam (N. Y.) Normal School, 1876-1879, he entered the University of the City of New York Medical Department, receiving his degree in 1882. Specializing in diseases of the ear, nose and throat, he became consulting aural surgeon to the New York Post-Graduate and Flushing hospitals and aural surgeon to the Manhattan Eye and Ear Hospital. He served as a member of the House of Delegates of the American Medical Association for six years, 1912-1917, and as chairman of the Section on Laryngology, Otology and Rhinology, 1923-1924. He was a member of the Board of Trustees from 1917 to 1924 and was for several years a member of the Executive Committee and also chairman of the board. Dr. Phillips became president-elect of the Association in 1925. He was a member of the American and of the New York otolaryngologic societies, and was president of the American Laryngological, Rhinological and Otological Society in 1907; he was also a member of the New York Academy of Medicine and in 1912 was president of the Medical Society of the State of New York. In 1919 Dr. Phillips helped organize the American Federation of Organizations for the Hard of Hearing and in 1920 became its first president. He was a fellow of the American College of Surgeons and in 1904 president of the New York County Medical Society. Dr. Phillips contributed much to the subject of otology in medical literature, including a textbook on "Diseases of the Ear, Nose and Throat, Medical and Surgical," which is used in many medical colleges. He was widely known in the medical profession for his high ideals, his enthusiastic leadership, his warm congeniality and his unwavering support of organized medicine.



WENDELL CHRISTOPHER PHILLIPS, M.D.
1857-1934

William Chittenden Lusk, New York; Bellevue Hospital Medical College, New York, 1893; member of the Medical Society of the State of New York; emeritus professor of clinical surgery, New York University, University and Bellevue Hospital Medical College; fellow of the American College of Surgeons; consulting surgeon to the Bellevue, St. Vincent's and Manhattan State hospitals; aged 66; died, October 24, of Parkinson's disease.

Mathew Nelson Voldeng ✠ Woodward, Iowa; College of Physicians and Surgeons of Chicago, 1887; member of the House of Delegates of the American Medical Association, 1912-1920 and in 1924; member and past president of the Iowa State Medical Society; member of the American Psychiatric Association; professor of pathology, 1897-1898, and of neurology and psychiatry, 1899-1902, Drake University Medical Department, Des Moines; superintendent of the Cherokee (Iowa) State Hospital, 1902-1915; medical superintendent of the Hospital for Epileptics and School for Feebleminded; aged 71; died, October 21.

Henry John Wynkoop ✠ Bath, N. Y.; New York University Medical College, 1898; Cornell University Medical College, New York, 1899; fellow of the American College of Surgeons; on the staffs of the Bath Hospital, Pleasant Valley Sanatorium and the Veterans' Administration Facility; aged 58; died, October 16, of coronary thrombosis.

John Alexander Cochran ✠ Brooklyn; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1881; veteran of the Spanish-American and World wars; for many years medical inspector in the health department; aged 74; died, November 1, in the Brooklyn Hospital, of heart disease.

William Jones Wallace ✠ Oklahoma City; University of the South Medical Department, Sewanee, Tenn., 1901; professor of genito-urinary diseases and syphilology, University of Oklahoma School of Medicine; member of the American Urological Association and fellow of the American College of Surgeons; on the staff of the State University Hospital; aged 61; died, September 19, of multiple myeloma.

Walter Booth Hotchkiss, Fort Steilacoom, Wash.; Chicago Homeopathic Medical College, 1904; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1906; on the staff of the Western State Hospital; aged 64; died, October 13, of lobar pneumonia and cerebral embolism.

Newton Harvey Lindsey ✠ Pauls Valley, Okla.; Memphis (Tenn.) Hospital Medical College, 1898; past president and secretary of the Garvin County Medical Society; fellow of the American College of Surgeons; part owner of the Lindsey-Johnson Hospital; aged 64; died, October 25, of coronary occlusion.

Charles James Howard ✠ Rutland Heights, Mass.; Columbia University College of Physicians and Surgeons, New York, 1897; member of the Colorado State Medical Society; for many years on the staff of the Veterans' Administration facility; aged 61; died, October 25, of heart disease and bronchial asthma.

George Rufus Drake ✠ Plymouth, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1906; past president of the Luzerne County Medical Society; aged 55; on the staff of the Wilkes-Barre (Pa.) General Hospital, where he died, October 15, following an operation for appendicitis.

Nelson Henry Beemer, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1874; formerly professor of mental diseases at his alma mater; member of the American Psychiatric Association; for many years superintendent of the Ontario Hospital, Mimico; aged 81; died, September 23.

Archie W. Herrick ✠ Bay City, Mich.; Saginaw (Mich.) Valley Medical College, 1901; past president of the Bay County Medical Society; at one time health officer of Bay City; on the staff of the Mercy Hospital; aged 66; died, October 22, of gallbladder disease and angina pectoris.

James David Hobson ✠ Missoula, Mont.; Cleveland College of Physicians and Surgeons, Medical Department Ohio Wesleyan University, 1910; served during the World War; secretary of the Western Montana Medical Society; aged 50; died, October 13, of pneumonia.

Theodore Hamilton Weagley ✠ Marion, Pa.; College of Physicians and Surgeons, Baltimore, 1882; past president of the Franklin County Medical Society; on the staff of the Chambersburg (Pa.) Hospital; aged 72; died suddenly, September 24, of angina pectoris.

General of Mixcoac, the Instituto de Higiene of Popotla, the

Va., in June.

Sophie Bade Scheel, Passaic, N. J.; New York Medical College and Hospital for Women, New York, 1901; formerly professor of the practice of medicine at her alma mater; aged 75; died, October 10, at her home in Rosemawr, of cerebral embolism and arteriosclerosis.

Benjamin George Moran ⊕ Nashua, N. H.; University of the City of New York Medical Department, 1891; fellow of the American College of Surgeons; aged 64; on the staffs of the Nashua Memorial Hospital and St. Joseph's Hospital, where he died, September 26.

James Wesley McClendon, Supply, Okla.; Kentucky School of Medicine, Louisville, 1894; member of the Oklahoma State Medical Association; medical superintendent of the Western Oklahoma Hospital; aged 66; died, October 2, at his home in McAlester.

George Wells Fitz, Peconic, N. Y.; Harvard University Medical School, Boston, 1891; aged 74; died, October 28, in the Eastern Long Island Hospital, Greenport, of injuries received when the automobile in which he was driving was struck by a train.

Frank Leavens Walton, Muskogee, Okla.; Louisville (Ky.) Medical College, 1890; member of the Oklahoma State Medical Association; formerly member of the state legislature; at one time county health officer; aged 66; died, October 6, of pernicious anemia.

William Patrick O'Ready ⊕ Claymont, Del.; Georgetown University School of Medicine, Washington, D. C., 1927; on the staffs of the Wilmington General, Delaware and St. Francis hospitals, Wilmington; aged 38; died suddenly, October 9, of heart disease.

James Barbee O'Bannon ⊕ Mount Carmel, Ky.; University of Louisville School of Medicine, 1892; secretary of the Fleming County Medical Society; for many years county health officer; aged 70; died, October 23, of sarcoma of the hip and sigmoid.

William Constantine Abaly, Madison, Wis.; College of Physicians and Surgeons of Chicago, 1886; aged 71; died, October 12, in the Wisconsin State Hospital, Mendota, of cerebral hemorrhage, bronchopneumonia and arteriosclerosis.

Henry J. Harnisch ⊕ Flagstaff, Ariz.; St. Louis Medical College, 1881; member of the Missouri State Medical Association; for many years on the staff of the Lutheran Hospital, St. Louis; aged 76; died, October 23, of heart disease.

Herbert Rogers Wardlaw ⊕ San Angelo, Texas; University of Texas School of Medicine, Galveston, 1907; aged 52; on the staff of the Shannon West Texas Memorial Hospital, where he died suddenly, October 11, of heart disease.

Joseph Isaac Bluestone, Brooklyn; University of the City of New York Medical Department, 1890; for many years on the staff of the Beth Israel Hospital; aged 74; died, November 2, of cerebral thrombosis and bronchopneumonia.

Homer Elbert McGhee, Kansas City, Mo.; University Medical College of Kansas City, 1912; member of the Missouri State Medical Association; served during the World War; aged 49; died, October 14, of pneumonia.

Thomas Hayden Ensor, Omaha; St. Louis Medical College, 1880; formerly mayor of South Omaha; aged 76; died, October 13, in the Providence Hospital, Detroit, of chronic cholecystitis and coronary thrombosis.

Leonard Daniel McCarthy, Perry Point, Md.; George Washington University School of Medicine, Washington, D. C., 1929; aged 35; on the staff of the Veterans' Administration Facility, where he died, October 11.

Philip H. Comas, Baxley, Ga.; University of Maryland School of Medicine, Baltimore, 1882; member of the state legislature and formerly state senator; aged 73; was found dead, October 19, of heart disease.

J. W. Crewdson, Louisiana, Mo.; University of Louisville (Ky.) School of Medicine, 1880; member of the Missouri State Medical Association; mayor of Louisiana; aged 75; died, September 29, of chronic nephritis.

John Walter Crews, Atwood, Okla. (registered in Oklahoma by the state board of health, under the Act of 1908); member of the Oklahoma State Medical Association; aged 69; died, in October, of pneumonia.

Wilbur Ervin Wendt, Beaver Dam, Wis.; University of Wisconsin Medical School, Madison, 1934; aged 23; died, October 2, in the Wisconsin General Hospital, Madison, of chronic nephritis and uremia.

John Aloysius Hickey, Winthrop, Mass.; Harvard University Medical School, Boston, 1896; aged 68; died, October 26, of arteriosclerosis, chronic endocarditis, acute nephritis and bronchopneumonia.

Margaretta Rulison Riegel Valentine, New York; Syracuse University College of Medicine, 1912; aged 50; died, October 9, in the Holy Name Hospital, Teaneck, N. J., of intestinal obstruction.

Louis Frederick Arensberg, Arensberg, Pa.; University of Michigan Medical School, Ann Arbor, 1867; Civil War veteran; formerly member of the state legislature; aged 91; died, September 21.

Margaret Billingsley Mills, Ottumwa, Iowa; Northwestern University Woman's Medical School, Chicago, 1893; formerly city health officer; aged 72; died, September 30, in the Ottumwa Hospital.

Otis Wood Allison ⊕ Danville, Ill.; Rush Medical College, Chicago, 1905; aged 57; on the staff of the Lake View Hospital, where he died, October 28, of aplastic anemia and acute myeloid leukemia.

William Stephen Lynch, Buffalo; University of Buffalo School of Medicine, 1904; served during the World War; aged 54; died, November 1, in the Sisters Hospital, of cardiovascular disease.

William T. Hamilton, Athens, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1905; aged 67; died, October 20, in the General Hospital, of nephritis, arteriosclerosis and uremia.

Herbert Clift Brown ⊕ Brookfield, N. Y.; Syracuse University College of Medicine, 1881; for many years health officer of Brookfield; aged 77; died, November 1, of cerebral hemorrhage.

Jackson M. Nunez, Swainsboro, Ga.; University of Georgia Medical Department, Augusta, 1886; member of the Medical Association of Georgia; aged 75; died, in October, of cerebral hemorrhage.

Rossie R. Walker, Laurens, S. C.; University of Louisville (Ky.) School of Medicine, 1908; member of the South Carolina Medical Association; aged 51; died, October 16, of coronary thrombosis.

John Felton Taylor, San Francisco; College of Physicians and Surgeons of San Francisco, 1918; aged 42; died, September 19, in St. Joseph's Hospital, of carcinoma of the urethra.

Leo Charles Kinsella, Chicago; Chicago Medical School, 1923; member of the Illinois State Medical Society; aged 52; was found dead, October 24, of carbon monoxide poisoning.

Albert Brandon Davenport, Columbus, Ohio; Columbus Medical College, 1890; aged 72; died, October 18, in St. Anthony's Hospital, of arteriosclerosis and bronchopneumonia.

Edward Orton Willoughby, Dayton, Ohio; Cleveland Homeopathic Medical College, 1901; formerly county coroner; aged 60; died suddenly, October 15, of coronary thrombosis.

Robert William Oakley, Moline, Ill.; Northwestern University Medical School, Chicago, 1902; served during the World War; aged 59; died, October 18, in the Moline City Hospital.

William Edgar Vaden, Chattanooga, Tenn.; Vanderbilt University School of Medicine, Nashville, 1899; member of the Tennessee State Medical Association; aged 62; died, October 22.

James Martin Joshua Luke ⊕ Miami, Fla.; University of Louisville (Ky.) School of Medicine, 1913; served during the World War; aged 45; died, October 9, of angina pectoris.

Caleb Huntington Atwater, Wallingford, Conn.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1871; aged 91; died, October 28.

Clarence Burdette Wean, Andover, Ohio; Western Reserve University Medical Department, Cleveland, 1901; aged 57; died suddenly, October 14, of angina pectoris.

Edwin Barney Herring, Dundee, Miss.; Vanderbilt University School of Medicine, Nashville, Tenn., 1888; aged 70; died, October 20, of a self inflicted bullet wound.

William Thomas Greene, Bumpus Mills, Tenn.; University of Tennessee Medical Department, Nashville, 1894; aged 75; died, October 9, of carcinoma of the prostate.

Edward Everett Kenyon, South Kingstown, R. I.; University of Vermont College of Medicine, Burlington, 1880; aged 74; died, September 22, of angina pectoris.

Joseph Albert Lowe, Pleasant Prairie, Wis.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1902; aged 64; died suddenly, October 16, of angina pectoris.

William Rupert Esdale, Ottawa, Ont., Canada; McGill University Faculty of Medicine, Montreal, Que., 1926; aged 33; died, October 17, of meningitis.

John Brodie Head, Gallatin, Tenn.; University of Nashville Medical Department, 1869; aged 85; died, September 29.

Bureau of Investigation

KELPE'KOE

The Commercial Possibilities of Crude Ore as a "Patent Medicine"

"Kelpe'koe" is a later name given to a product known earlier as "Pacific Health Ore." In the latter part of 1931 it was reported that a Mr. Ben Sweetland, president of the Sweetland Advertising, Inc., of New York City, had become interested in the financial possibilities of selling this brand of crushed rock as a "patent medicine." As a result of this interest, Kelpe'koe, Inc., was brought into existence.

The company was incorporated Dec. 15, 1931, under the state laws of Arizona, with 5,000,000 shares of common stock at a par value of 10 cents a share to be sold to the public at 20 cents a share. Of these 5,000,000 shares, 1,103,429 shares were issued to the Pacific Health Ore Company for all the assets of that company, including perpetual lease on the deposit of shale and a contract to purchase the property outright and the exclusive distribution of the ore. One half of the 5,000,000 shares, or 2,500,000 shares, were "issued or to be issued for bonuses, services, etc." On Oct. 30, 1934, the Corporation Commission of the State of Arizona reported that since 1932 Kelpe'koe, Inc., had failed to file reports or pay its annual registration fee as required by law. It appears, therefore, that the company is "legally dead" under the laws of Arizona.

THE STOCK-SELLING SCHEMES

In January 1932, promotional letters were sent out by W. L. Coe & Company of Seattle, setting forth the alleged commercial possibilities in the sale of the product Kelpe'koe. W. L. Coe & Company have been described as "a small concern doing a mail-order and telephone business in mining stocks." It is of incidental interest to learn that the broker's license of W. L. Coe & Company is said to have been canceled in June 1932. The promotional literature sent out by the Coe concern enlarged on the marvelous financial possibilities in the sale of blue shale at $4.85 a pound or $9,700 a ton!

In the stock prospectus sent out at this time, it was stated that Kelpe'koe, Inc., was located at Salem, Ore., and had a capitalization of $500,000, "all common and non-assessable." The following were given as the officers and directors of the company: Ben Sweetland, D. R. Riegel, P. D. Ott, R. H. Pfeffer, Bailie N. Savage.

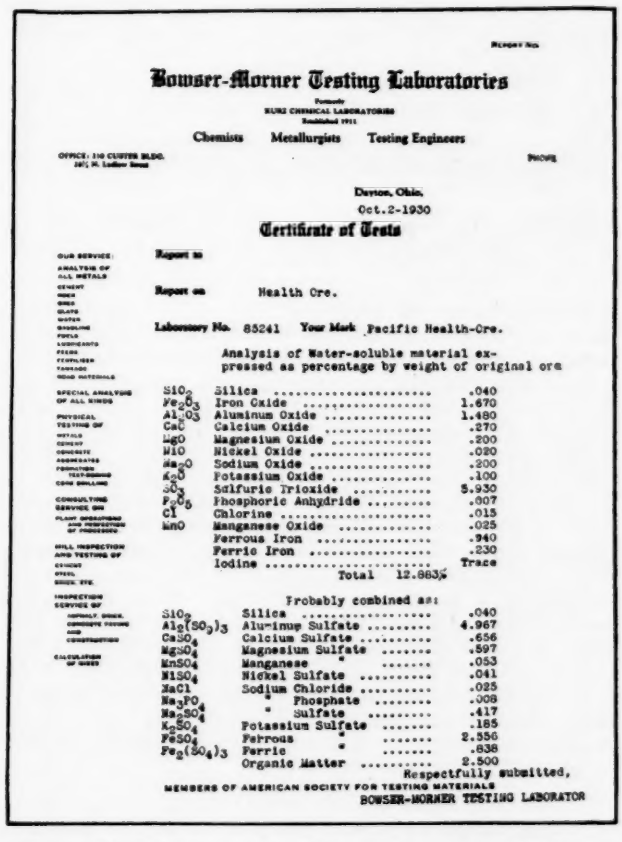
Further, according to the prospectus, the company was sending out daily 10,000 letters advertising Kelpe'koe, from which it was claimed they received 600 to 800 orders a day. From this the promoters estimated that this should net the company a profit of from $50,000 to $100,000 a month. At that time, according to the prospectus, shares in Kelpe'koe, Inc., were being offered, not at twenty cents, but at thirty cents each.

As already stated, the first prospectus was sent out in January 1932 by W. L. Coe & Company. In the same month another series of Kelpe'koe stock-selling letters was sent out by the American Exploration Company of Spokane, Wash. These letters were signed B. Saunders, secretary-treasurer of the American Exploration Company. A follow-up on this promotional letter came on the stationery of R. H. Pfeffer, whose letterhead described him as president of the American Exploration Company. Mr. Pfeffer, it will be noted, was one of the men listed as an officer and director of Kelpe'koe.

The letters from the American Exploration Company were typical of dubious promotional schemes. They stressed the instances of other companies that had started as midgets and had become financial giants; they reminded the prospective purchaser "of the millions of dollars that are made annually in 'patent medicines'"; they estimated that Kelpe'koe stock would have "an earning power of from 12 cents to 24 cents per share and a potential market value of at least $1 to $2 a share the first year."

The letters further impressed the prospective buyer with "the fact that there are only a very few shares of Kelpe'koe stock available for distribution." There was enclosed with the letter a "$10 option on 250 shares of stock in Kelpe'koe, Inc." and the recipient was urged to send $10 for this option certificate. He was told that if he sent in the $10 he would be under no obligation to purchase the additional 200 shares, but would receive 50 shares for the $10. Those who were thus approached but failed to send in the $10 received some days later a letter from Mr. R. H. Pfeffer. This letter was even more appealing than the earlier one, and the recipient was urged to send in $10 in full payment for the option certificate already referred to and any time within thirty days from the date of Mr. Pfeffer's letter the $10 would be returned if the purchaser was not satisfied.

A later letter from Mr. Pfeffer in February 1932 enclosed three certificates of stock (one for 100 shares and two for 200 shares each) in Kelpe'koe, Inc., issued in the name of the person to whom the letter was written and to whom was given the "privilege of purchasing from 100 to 500 shares at 20 cents a share"—provided the remittance was mailed not later than twelve days following the receipt of the letter. The stock certificates were very imposing, printed in green and black, and bore what purported to be serial numbers imprinted in red.



Bowser-Morner Testing Laboratories

Chemists Metallurgists Testing Engineers

Dayton, Ohio,
Oct. 2-1930

Certificate of Tests

Report on Health Ore.

Laboratory No. 85241 Your Mark Pacific Health-Ore.

Analysis of Water-soluble material expressed as percentage by weight of original ore

SiO_2	Silica	.040
Fe_2O_3	Iron Oxide	1.670
Al_2O_3	Aluminum Oxide	1.480
CaO	Calcium Oxide	.270
MgO	Magnesium Oxide	.200
NiO	Nickel Oxide	.020
Na_2O	Sodium Oxide	.200
K_2O	Potassium Oxide	.100
SO_3	Sulfuric Trioxide	5.930
P_2O_5	Phosphoric Anhydride	.007
Cl	Chlorine	.015
MnO	Manganese Oxide	.025
	Ferrous Iron	.940
	Ferric Iron	.230
	Iodine	Trace
	Total	12.883%

Probably combined as:

SiO_2	Silica	.040
$Al_2(SO_4)_3$	Aluminum Sulfate	4.967
$CaSO_4$	Calcium Sulfate	.656
$MgSO_4$	Magnesium Sulfate	.597
$MnSO_4$	Manganese "	.053
$NiSO_4$	Nickel Sulfate	.041
NaCl	Sodium Chloride	.025
Na_3PO_4	" Phosphate	.008
Na_2SO_4	" Sulfate	.417
K_2SO_4	Potassium Sulfate	.185
$FeSO_4$	Ferrous "	2.856
$Fe_2(SO_4)_3$	Ferric "	.838
	Organic Matter	2.500

Respectfully submitted,
MEMBERS OF AMERICAN SOCIETY FOR TESTING MATERIALS
BOWSER-MORNER TESTING LABORATORY

Photographic facsimile of an analysis sent out when Kelpe'koe was being promoted as a stock selling proposition. The earlier name for Kelpe'koe was Pacific Health Ore. Note that the ingredients are shown to be combined in *inorganic* and not *organic* form, as claimed by this concern. Note, too, that the only ingredients present in substantial amounts are aluminum sulphate and iron (ferrous) sulphate—green vitriol. No cobalt was reported found!

The American Exploration Company is said to have sold over a million shares of Kelpe'koe, Inc., stock, from the sale of which it received over $8,000 and Kelpe'koe, Inc., over $24,000. Presumably Mr. Pfeffer, as president of the former company and as an officer and director of the latter, participated in the profits of both. The National Better Business Bureau reports that in February 1932 the Pennsylvania Securities Commission served notice on the American Exploration Company to cease offering stock in Kelpe'koe, Inc., in Pennsylvania. The American Exploration Company, like many other concerns with which Mr. Pfeffer has at times been connected, seems no longer to be in existence.

THE PRESENT CONCERN

So much for the earlier promotional activities of Kelpe'koe. Today the company is said to have the following personnel:

Pheron D. Ott, president; D. R. Riegel, vice president, and Bailie N. Savage, secretary, treasurer and manager; the directors of the company are also its officers. Ben J. Sweetland, its first president, withdrew in 1932; R. H. Pfeffer, his successor, withdrew in 1933.

Just as the earlier personnel included no physicians or pharmacists but did include advertising men and stock promoters, so the present officers and directors are without medical or pharmaceutical qualifications. Mr. Ott, the president, is said to have been engaged previously in the gasoline service-station business and later to have been an employee of a grocery concern. Mr. Riegel, its vice president, is said to be,

Photographic reproduction (greatly reduced) of one of the Stock Certificates for 200 shares that were sent out by Mr. Pfeffer, former president of the Kelpe'koe concern, when he was attempting to promote the sale of stock in his company.

and to have been for many years, in the automobile agency business. Mr. Savage, it appears, was a bank clerk prior to becoming secretary, treasurer and manager of Kelpe'koe, Inc.

It is a curious and possibly significant fact that, although Kelpe'koe, Inc., has been doing business for three years in the state of Washington and has sent and is sending out from Seattle quantities of advertising matter all over the United States, the secretary of state at Olympia, Wash., notified the Bureau of Investigation, in reply to a request, that the department of state was "unable to locate Kelpe'koe, Inc., on the records of this office, either as a foreign or domestic corporation." From this it would seem that Kelpe'koe, Inc., as a corporation is legally dead in Arizona, where it was first incorporated, and is legally unknown in the state of Washington, where it has its quackery headquarters. It would appear from the Revised Statutes of Washington that as Kelpe'koe, Inc., as a foreign corporation has failed to pay its annual license fee and to file and record its certified copy of the charter, as well as the appointment of its agents, it is subject to certain penalties, as provided by the state law.

WHAT IS KELPE'KOE?

As part of the advertising "come-on" in the W. L. Coe & Company prospectus, there was reproduced what purported to be an analysis of the product, made by the Bowser-Morner Testing Laboratories of Dayton, Ohio. This analysis is reproduced in miniature with this article. It will be seen from this analysis that the essential substances in Kelpe'koe are aluminum sulphate and ferrous sulphate (green vitriol). The other ingredients may be disregarded because of their minute amounts. The method of using this preparation will be referred to later.

In the circular letter that accompanied the reproduction of the Bowser-Morner Testing Laboratories' report, it was stated:

"The laboratory report was startling, indeed. The ore was found to contain fifteen different minerals—the very elements contained in the human body. And furthermore, tests revealed that these minerals were in organic form . . ."

This wording is typical of the loose use of scientific terms common to nostrum exploiters. The body does *not* contain fifteen "minerals," although it does contain more than that number of "elements." Even the analysis referred to, it will be noted, discloses *not* fifteen elements, but only thirteen, and specifically declares that these elements were combined in the *inorganic* form and not in the organic form, as the promoters' letter said.

As originally exploited, the product was put out as a frank cure-all, and it was claimed that "sensational results have been obtained with Pacific Health Ore in the following conditions: Diabetes, Kidney and Liver Disorders, Gas and Ulcers of the Stomach, Hemorrhoids, Colitis, Eczema and Skin Trouble, Rheumatism, Goiter, Tonsillitis, Infections, Female Disorders, Etc." After the change of name from Pacific Health Ore to Kelpe'koe, the therapeutic claims became more specific. And the price was nearly doubled! As Pacific Health Ore it was sold for $2.50 a pound; as Kelpe'koe it was sold for $4.85 a pound. "Never give the sucker a break!"

One of the specific claims for Kelpe'koe was that it was a "rejuvenator"—and was "the most effective natural tonic and body builder for men and women ever discovered in the history of medical research." One letter sent out by Kelpe'koe, Inc., opened with this paragraph:

"Rejuvenate! What a word to conjure with! How vividly it recalls Goethe's immortal poem, Faust—the most dramatic story of rejuvenation ever written."

Then in the four-page broadside, the *Kelpe'koe News*, under the heading: "Men—Old Age Deferred—Youthful Glands":

"Owing to the glandular rejuvenation of Kelpe'koe, it is a most potent factor in renewing strength and restoring vigor and vitality."

Kelpe'koe is sold today in two forms—"Natural" and "Capsules." Kelpe'koe "natural" comes in a carton of four quarter-pound packages of the crushed ore. The instructions for preparing it as a medicine are to empty one of the quarter-pound packages into a bottle and pour over it a pint of hot water. This is to be allowed to stand for twenty-four hours, shaking occasionally and then straining off the supernatant liquid, which is to be taken one or two teaspoonfuls at a time, diluted in a glass of water. "Kelpe'koe Capsules" contain a dirty-white powder said to be produced by the evaporation of strong solutions of "Kelpe'koe Natural."

The Kelpe'koe concern's recent advertising has been devoted to the thesis that solutions of this crushed ore will cure diabetes. The outfit even has the effrontery to circularize physicians, to whom it particularly recommends the "Capsules."

A year after the first stock-selling letter was sent out with the laboratory report, the Kelpe'koe concern added *cobalt* to the list of the alleged ingredients of its nostrum. In this connection the following facts are of interest: The names of three laboratories have been used in the advertising of Kelpe'koe: Bowser-Morner Testing Laboratories of Dayton, Ohio, already referred to; Arthur D. Little, Inc., Cambridge, Mass., and A. L. Knisely Chemical Laboratories, Seattle. (Mr. Knisely is described by Kelpe'koe as "former Chief Chemist for the U. S. Pure Food and Drug Administration at Seattle.")

★ **USERS OF INSULIN**
have obtained some measure of relief and scientific research has now developed a treatment of more permanent benefit, to be used with or without Insulin. More liberal diet permitted. Write Kalpokoe Corporation, Seattle, Washington.

Most of the Kelpe'koe advertising seems to be of the "direct-by-mail" type. Some advertising has been done in magazines of the cheaper type.

The implication in the Kelpe'koe advertising is that all these analysts found "cobalt" among other ingredients in the ore. A glance at the Bowser-Morner report shows that that laboratory did not mention cobalt as an ingredient. Arthur D. Little, Inc., reports that they also did not report on finding cobalt—in fact, they were given a list of the Kelpe'koe ingredients and asked to determine whether the material submitted corresponded with the list given—and cobalt was not in the list!

But apparently it was decided that cobalt would make good advertising material when the Kelpe'koe concern had unearthed an old and obscure newspaper clipping that fitted in with the plan to exploit the nostrum as a cure for diabetes. It appears that a French physician, Bertrand, claimed in 1926 that the potency of insulin for the elimination of dextrose in the blood would be increased when the reaction takes place in the pres-

ence of infinitesimal amounts of nickel and cobalt. The Kelpe'koe concern is sending out today (1934) a photographic reproduction of a news item reporting the meeting of the American Chemical Society Institute at Northwestern University at Evanston, Ill. This item referred to the mention—entirely incidental—of Bertrand's theory. The Kelpe'koe letter that accompanies the reproduction of the news item states that this is a "report which bids fair to revolutionize all former ideas as to the treatment of diabetes." The news item bears a date line of August 1 but no year. Recipients naturally infer that it means August 1934; actually the meeting was held six years ago—in 1928!

The facts are that, although eight years have elapsed since Bertrand first made his report, his theory has found no general acceptance by scientific medicine.

The perniciousness, not to say wickedness, of exploiting this crude ore as a rational treatment for diabetes, and the implied claim that by using it, it will be possible to abandon the use of insulin, is, of course, not as obvious to the diabetic as it is to every physician. Not that the Kelpe'koe concern is crude enough to state that its product is a specific or a cure for diabetes. "Patent medicine" concerns in 1934 don't work that way. Kelpe'koe, Inc., in fact, specifically states that the product is "not offered to you as a medicine, specific or cure,"—and then goes on to publish testimonials alleged to be from diabetics who claim to have been cured! As has already been stated, on the admission of the exploiters themselves, the person who takes Kelpe'koe is getting, for all practical purposes, merely a solution of alum and iron sulphate.

In due time, undoubtedly, the overworked branch of the federal authorities that looks into the misuse of the mails by quacks and others will get around to Kelpe'koe, Inc. This, too, in spite of the fact that the Kelpe'koe concern in its advertising states that "Among the users and boosters for Kelpe'koe are included . . . Post Office inspectors. . . ."

Correspondence

FLAT FEES IN INDUSTRIAL MEDICAL SERVICE

To the Editor:—May I call your attention to the following action taken by the Lumbermens Mutual Casualty Company, 4750 Sheridan Road, Chicago:

Recently I received many communications from members of the Chicago Society of Industrial Medicine and Surgery stating that they had been sent a flat fee of $4.50 on all bills they had rendered to the Lumbermens Mutual Casualty Company for medical services to injured employees coming under the Illinois workmen's compensation act when these employees lost no time from work. This $4.50 was to remunerate them for their services regardless of the size of their bill, in some instances the bill running well above $20 but rarely as low as $4.50. This action was taken without consulting the doctors in question, and on making inquiry of Mr. Howe, second vice president and general claim manager, they were informed that, from a study the Lumbermens Mutual Casualty Company had made, the bill for medical and surgical services should not average over $4.50.

At a special meeting of the Chicago Society of Industrial Medicine and Surgery, called for the purpose of discussing this particular question, the unanimous decision was that the secretary be instructed to inform Mr. Howe, second vice president and general claim manager of the Lumbermens Mutual Casualty Company, that the doctors specializing in industrial medicine and surgery were unanimously opposed to a flat fee proposition and that they were unanimously rejecting this proposition of $4.50. The secretary notified Mr. Howe of the action of the society but he did not as much as acknowledge the letter, and I understand that, regardless of the protest, he is proceeding with this plan, apparently hoping that at this time of financial distress some of the doctors might possibly accept the flat fee proposition.

A $4.50 fee cannot possibly buy proper medical and surgical attention to injured workmen, who are entitled to the best medical and surgical services that money can buy. We are at a loss to understand why an institution as large as the Lumbermens Mutual Casualty Company is alleged to be resorts to cutting the doctor's medical and surgical fees when the other insurance companies writing the same class of business continue to pay their bills on a fee basis, not on flat rates.

If the Lumbermens Mutual Casualty Company succeeds, it will probably force the companies handling similar business to adopt the $4.50 fee plan or to discontinue writing compensation insurance, for no insurance company could compete with the Lumbermens Mutual Casualty Company in writing compensation insurance. The final answer would be for the industrial surgeon either to accept the $4.50 flat fee or discontinue doing industrial work.

W. C. NORDHOLZ, M.D., Chicago.
Secretary-Treasurer, Chicago Society of
Industrial Medicine and Surgery.

INTRAVENOUS THERAPY AND VENOCLYSIS

To the Editor:—Reading the communication on the intravenous drip by W. Forrest Dutton in THE JOURNAL, October 20, was like hearing from an old friend, because his book Intravenous Therapy has been my vade mecum since its publication.

I was surprised to learn that any discussion had arisen over the priority of the intravenous drip. I had always ascribed that honor to Dr. Matas and never supposed that there was any question or doubt about it.

In my paper of December 1924 in *Southern Surgical Transactions* for 1924 will be found quotations with ample credit to Friedman, Penfield and Teplitz, Unger and Huess, Matas, Woodyatt, Sansum and Wilder. My "bid for fame" rests on the fact that I have devised an apparatus and worked out a technic by which this "means of grace" is made instantly available and its range of useful application expanded almost without limit in the field of therapeutics. By using the modus operandi that I employ, men all over the country have succeeded in achieving results considered impossible, as their letters to me will verify. For example, I have kept patients alive and in a fair state of physical prosperity for twenty-one days, excluding all other sources of nutrition. With the same technic, blood transfusions can be regulated with due regard to the ratio between delivery and distribution and dangerous reactions thereby avoided. By guaranteeing absolute rest to the stomach I have to date cured thirty-five cases of gastric and duodenal ulcers. Then why should I worry about priority? Thomas Edison neither discovered nor invented electricity, Henry Ford did not invent the automobile and Napoleon did not invent war.

I wish to say in defense of my so-called hybrid word that it was submitted before the Southern Surgical Association in December 1924 in the following language, which appears on the title page of my article as a footnote: "I feel very apologetic for the use of a word as the title of my paper that has not received the stamp of approval or been authorized by custom. But, in searching for a name that was descriptive and euphonious to apply to this somewhat rare therapeutic measure. I fell upon the term venoclysis by analogy. We have proctoclysis, hypodermoclysis; why not venoclysis?"

Seven years elapsed before any suggestions of its impropriety were registered. In the meantime it had become current and found its way into the newer dictionary (Dorland), which might be considered a mark of authoritative recognition. I believe that words, like people, should be rated according to their

utility rather than their origin. Some of our most useful and distinguished citizens sprang from a dual or dubious source.

If venoclysis is denied admission to our medical vocabulary, in order to be consistent we must banish such words as ovariotomy, appendectomy and almost all of those ending in the good old Greek suffix "itis." Even appendicitis, duodenitis and a host of others would have to go. Besides, venoclysis is such a nice word. It possesses euphony. It trips lightly off the tongue and falls musically on the membrana tympani. It at once proclaims its meaning and makes a proximate appeal to the average man and has rendered ten years of useful service.

G. A. HENDON, M.D., Louisville, Ky.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

NONSPECIFIC URETHRITIS

To the Editor:—A white man, aged 24, had a discharge from the urethra about ten days following illicit intercourse. There was some burning on urination as well as increased frequency. He was first seen by another physician, who took smears that were negative for gonococci. He was given two injections of mild silver protein by this physician, with a subsidence of the discharge. Because his doctor did not take his case seriously, he consulted me for further treatment. The discharge five days after it first appeared was seropurulent in character, which left a yellowish stain on gauze. I have given him injections of a silver antiseptic for the past three weeks with but slight improvement in the amount of the discharge. Diathermy to the prostate and prostatic massage have also been given without improvement. The patient is a lawyer and is considerably upset by his predicament, as he contemplates marriage within a few months. In about ten smears that have been taken and examined, gonococci have not been discovered, merely numerous pus cells. My first impression was gonorrhea, but since the condition did not yield to treatment and no specific organisms have ever been found, I felt that he might be suffering from a nonspecific urethritis. At the present writing, about six weeks after the onset, there is no frequency, urgency, nocturia or dysuria. The discharge still persists in spite of treatment and is almost serous in character with white specks and matting at the meatus. The teeth, tonsils and gallbladder are normal, and the Wassermann reaction is negative. He has been complaining of dull pains in the right lower quadrant of the abdomen for some time and was told by his doctor that he had chronic appendicitis. Could a prostatis from a focal infection elsewhere give such a clinical picture? Is it possible that this man has a gonorrheal infection without my being able to find the organisms on smear? Please omit name. M.D., New York.

ANSWER.—From the data submitted there is little evidence that a gonococcic infection is being dealt with in this case. The length of the incubation period, while not ruling it out, certainly minimizes this possibility. This presumption is strengthened by the fact that no positive smears have been obtained. To be unable to demonstrate gonococci in the profuse untreated discharge of a specific urethritis would be unusual.

The symptomatology presented and the clinical course outlined arouse the suspicion of an acute urethral flareup based on a preexistent pathologic condition of the lower urinary tract. The influence of trauma (sexual or otherwise), prolonged drinking, infections of the upper respiratory tract and distant foci has repeatedly been demonstrated in the activation of these otherwise dormant pathologic conditions. Great care must be exercised in this particular case to exclude the presence of seminal vesiculitis, which may be determined by the microscopic examination of the prostatovesicle fluid obtained on massage and stripping. If repeated massage reveals only normal bodies, attention is directed to the possible presence of a urethral stricture. Cysto-urethroscopic study is indicated should these studies fail to bring to light pathologic changes.

Treatment in this particular case will naturally depend on the results of these diagnostic measures. The presence of a seminal vesiculitis or prostatitis will require regular weekly massage followed by the through and through irrigation or deep instillation of some such solution as 5 per cent silvol. Should a strictured urethra be encountered, progressive dilation and instillation of the urethra is indicated. In those cases of nonspecific urethritis not complicated by prostatic or seminal vesiculitis or the presence of urethral stricture, irrigations of mercuric oxycyanide solution in 1:4,000 dilution act in most cases as a specific. This could well be used in the treatment of this case either with or without massage.

RECURRENT DISLOCATION OF SHOULDER

To the Editor:—A white man, aged 35, in good health, has a left shoulder which dislocates easily, with anterior dislocation, either being necessary to effect reduction. Please advise where suitable exercises for strengthening this joint may be obtained. Is surgery to close rent in capsule indicated? Kindly omit name. M.D., Iowa.

ANSWER.—The treatment of recurrent dislocation of the shoulder depends to some extent on the nature of the condition. In some instances, defects in the head of the humerus that may be due to obstetric paralysis, infantile paralysis or congenital defects or to changes that occurred after the first dislocation may be present. Occasionally, as the result of fractures at the time of the first dislocation, the glenoid cavity is left deformed or with the anterior and inferior edge displaced. Fractures of the greater or lesser tuberosity of the humerus sometimes complicate the picture at the time of the first dislocation and the resulting diminution of function of the supraspinatus and infraspinatus muscles predisposes to repeated dislocations. Weakness of the supraspinatus and infraspinatus muscles as a result of injury or paralysis also predisposes to shoulder luxation.

The most common pathologic condition, however, is found in the capsule itself and consists of a wide rent in the anterior and inferior portion of the joint capsule and in detachment of this portion of the capsule from the margin of the glenoid cavity, occurring at the time of the first dislocation. Such defects tend to repair by scar tissue, which is usually overstretched each time that the head of the humerus slips out of the glenoid until the joint becomes so relaxed that it is no longer stable.

Judging from the brief description, the patient probably falls within the latter group. If there is no definite evidence of muscular weakness, particularly of the deltoid, supraspinatus and infraspinatus muscles, and no contracture of the pectoralis major, teres minor or latissimus dorsi, exercises cannot be expected to strengthen the joint. Operations for prevention of redislocation have been varied. Exposure of the joint in its anterior inferior aspect by way of the axilla and plication of the capsule has been advocated. Other surgeons have preferred to use strips of fascia lata for reenforcement of the relaxed joint. In some instances these fascial strips have stretched so that the defect in the capsule has recurred. Within recent years many orthopedic surgeons have adopted a technic described by Nicola, which utilizes the long head of the biceps muscle to stabilize the shoulder joint successfully. In the hands of those who have used it extensively, this procedure has been almost uniformly successful.

Other procedures that have not been widely adopted consist of the use of a tendon sling through the humeral head formed from one of the peroneal tendons of the foot or a procedure to deepen the glenoid by means of a bone graft driven into its anterior and inferior edge.

This subject has been briefly reviewed in a recent paper by Nicola: Recurrent Dislocation of the Shoulder, *J. Bone & Joint Surg.* **16**:663 (July) 1934.

POSSIBLE LATENT SYPHILIS

To the Editor:—In November 1933 a Wassermann report of a patient was four plus alcohol antigen and four plus cholesterinized antigen. Physical examination was otherwise negative and there was no history of primary or secondary syphilis. A marital history was essentially negative. The man has three children living and well; a twin died soon after birth. He was given ten injections of 0.9 Gm. of neoarsphenamine intravenously and 2 cc. of iodobismitol intramuscularly, these medications being given at the same visit. Directly after the first course of ten injections he was given a second course, this time receiving eleven injections of the same medication and on March 24, 1934, at the end of the tenth injection a blood Wassermann reaction was one plus in alcohol antigen and one plus in cholesterinized antigen. He was then given a third course of ten injections of 0.75 Gm. of neoarsphenamine and 2 cc. of iodobismitol and following this last course on July 10 a blood Wassermann reaction was one plus in alcohol antigen and four plus in the cholesterinized antigen. What I should like to know is whether I am fully justified in trying to obtain a negative Wassermann reaction on this patient by further injections of neoarsphenamine. He is in excellent health and shows no symptoms of syphilis other than the Wassermann reaction. Any further suggestions you have in regard to this case will be appreciated. Please omit name and address. M.D., New York.

ANSWER.—The diagnosis of latent syphilis in this patient cannot be completely substantiated until after the spinal fluid has been examined. Lumbar puncture with a laboratory examination of the spinal fluid, including cell count, protein estimation, quantitatively titered Wassermann reaction with amounts of fluid ranging from 0.1 to 1 cc., and a colloidal gold, mastic or benzoin test, should be done immediately. If the spinal fluid is positive, treatment must not only be continued to deal with the asymptomatic neurosyphilis, which is likely to progress if the patient's treatment is stopped at this point, but in all

probability should be altered to include the use of tryparsamide, fever therapy or both. If the spinal fluid is negative, treatment may proceed on the assumption that the patient has latent syphilis.

The studies of the Cooperative Clinical Group (Venereal Disease Information **13**:317, 351, 371, 389 and 407, 1932; **14**:1, 1933) show that about 35 per cent of all patients with latent syphilis are Wassermann fast, that the optimal amount of treatment for latent syphilis consists of a little over a year of continuous treatment with alternating courses of an arsphenamine and compound of bismuth or mercury, and a second year of intermittent treatment with three long courses of a bismuth compound separated by rest periods of from two to three months. This amount of treatment should be given regardless of serologic progress.

In this particular patient it appears that thirty consecutive weekly combined treatments of 0.9 Gm. of neoarsphenamine and 2 cc. of iodobismitol have been given. This is overtreatment. If the spinal fluid test is negative, it would be wise to give the patient a rest of two or three months, to be followed with an eight injection course of neoarsphenamine given without bismuth, and in a dosage not exceeding 0.6 Gm. This course might be immediately followed by a twelve injection course of bismuth preferably with an insoluble salt such as the salicylate, a rest period of two or three months, another course of bismuth, another rest period, a third course of bismuth, and then treatment discontinued, the patient to be followed with periodic physical examinations at yearly intervals for the remainder of his life.

DIET IN RENAL DIABETES

To the Editor:—Is there a renal diabetes? And what would be the proper diet restriction? I have had a patient under observation four years whose blood sugar ranges from 120 to 150. Only once did it go to 180. The urine of this patient presents a marked glycosuria constantly. The quantitative analysis of a twenty-four specimen is always close to normal.

H. H. RITTENHOUSE, M.D., Bridgeville, Pa.

ANSWER.—Cases of renal diabetes, more properly termed renal glycosuria, actually occur although they are not common. This diagnosis can be made only when it has been shown that sugar appears in the urine at a time when the blood sugar is below the usual kidney threshold value of 180 mg. per hundred cubic centimeters. It must of course also be established that the sugar which appears in the urine is dextrose and not some other form of carbohydrate, which is being ingested. The simple yeast fermentation test is usually sufficient for the latter purpose. The only treatment advised for renal glycosuria is to avoid undernutrition through loss of sugar in the urine, by supplying additional carbohydrate in the diet.

In regard to this patient, it is difficult to understand how he could present a constant marked glycosuria and still not show much sugar in the twenty-four hour quantitative analysis. Two possibilities suggest themselves. If the single urine specimens that have been tested qualitatively have been taken shortly after meals, they might show a markedly positive test. However, these specimens when diluted in the total twenty-four hour specimen containing much normal urine might give a low total sugar content. If this is the case, the patient has alimentary glycosuria. At present it is advisable to regard such patients as potentially or mildly diabetic and treat them accordingly. The other possibility is that the patient is excreting some other form of sugar than dextrose and that the qualitative sugar test is not specific for dextrose, while the quantitative method used is specific.

EPILEPSY AND SYPHILIS

To the Editor:—A man, aged 35, developed epilepsy at the age of 28 years. His past history is negative for allergy, migraine and convulsions in childhood. There has been no epilepsy in other members of his family. The first epileptic seizure occurred in 1927, at which time a four plus Wassermann reaction of the blood was disclosed. Since then he has had grand mal seizures at the rate of one every four to six months. In 1930 the blood Wassermann reaction was strongly positive; the blood sugar was found decreased to 83.3 mg. He was given seventeen injections of neoarsphenamine. Three months ago, during another seizure, the blood Wassermann reaction was found to be four plus, but the spinal fluid Wassermann reaction and serologic tests were not reported. He has had no treatment since 1930. Physical examination at present is entirely negative. There are no stigmas of syphilitic infection. What treatment should be instituted if the spinal fluid Wassermann reaction is positive and serologic tests show a syphilitic colloidal gold curve? If the latter are negative? Please omit name.

M.D., New York.

ANSWER.—Epilepsy due to syphilis is relatively rare in the absence of outspoken neurologic manifestations of syphilis. When it occurs in patients who have syphilis it is usually associated with dementia paralytica (which seems unlikely in this case because of the long duration of the convulsions), or with a more or less purely vascular neurosyphilis. Although the neurologic changes in this case are not stated, it is probable that the patient has idiopathic epilepsy, which has no relation to syphilis. The spinal fluid should of course be examined. If the spinal fluid Wassermann reaction is positive in any dilution, regardless of other abnormalities in the cell count, protein content or colloidal gold curve, it would be desirable to treat the patient with fever, preferably malaria, which in turn should be followed by two years of continuous antisyphilitic treatment with alternating courses of tryparsamide, an arsphenamine and a bismuth compound. If the spinal fluid is normal, it may be stated that the patient has so far been inadequately treated for latent syphilis, whether or not associated with epilepsy. His treatment should be continued until he has received five full courses each of neoarsphenamine and a bismuth compound.

An effort should be made to control the epileptic seizures with phenobarbital, the dosage of which should be adjusted to suit the individual needs of the patient.

BRONCHIAL ASTHMA IN A SAXOPHONE PLAYER

To the Editor:—My brother, aged 24, had measles and diphtheria at the age of 6, the latter infection leaving him with a bilateral chronic purulent otitis media. Three years ago he presented allergic manifestations by violent and prolonged sneezing fits when he got out of bed in the morning. Two years ago he began to wheeze only while he slept. Last winter (1933) he was seized with a severe attack of bronchial asthma and coughing. He was relieved by epinephrine and morphine. From that time on exertion or walking against the wind always made him short of breath. One could hear him wheeze and cough. Roentgenograms were taken of his chest and sinuses with negative results. He was tested for irritants and was found markedly sensitive to feathers, rabbit hair and wool. He was mildly sensitive to dog, cat, horse and a few articles of food. He had a course of injections of stock dust vaccines without any apparent relief. Of course, his room is bare of any rugs, blankets and feathers, cotton and kapok having been substituted. For the past few months he has felt perfectly well during the day but every morning at about 5 o'clock he is awakened by a choking sensation and a paroxysm of coughing. He is spontaneously relieved at about 9 a. m., usually after a bowel movement. From this foregoing brief description will you please answer these questions: Is it possible that these attacks are initiated by an accumulation of feces in the bowel? Would a vaccine of the predominating fecal organisms be of any advantage? Would a stock vaccine of upper respiratory organisms be of any benefit? Is there a positive demand for him to discontinue his profession (saxophone playing)? Can you suggest any other drugs? I am and have been using potassium iodide, ephedrine and calcium. Any other suggestions that you have will be greatly appreciated.

M.D., New York.

ANSWER.—From the history and observations given there would seem to be no doubt that this patient is definitely allergic and has a true bronchial asthma. The chronic bilateral otitis media is probably of no importance here. The fact that he is short of breath on exertion would suggest the probability that the bronchial asthma is already complicated by a fairly severe emphysema; if this is true the emphysema has occurred very early in the course of the asthma; the saxophone playing, which further balloons out already distended lungs, is probably one reason, at least, for the early appearance of the emphysema. For this complication the best advice is to (1) quit playing the saxophone or any other wind instrument, (2) avoid overexertion and (3) apply some such instrument as was described by Alexander and Kountz (Symptomatic Relief of Emphysema by an Abdominal Belt, *Am. J. M. Sc.* **197**:687 [May] 1934), in which a belt, pad and bolt are used to increase the abdominal pressure so as to push up the diaphragm and so lessen the emphysema.

The best treatment of bronchial asthma is, of course, to find the cause of the attacks and to remove it. It might be wise to retest the patient by complete cutaneous and intracutaneous tests, to remove all offending substances (allergens) completely, and to take prolonged injections of those allergens which are important and which cannot wholly be avoided; e. g., rabbit hair, wool, feathers, house dust and horse dander. Such a course of treatment might well extend over one to three years, beginning with injections twice a week for three or four months, then once a week for a month or two, then once in two weeks to keep up what immunity is acquired by the injections. Short courses of treatment usually fail.

In addition, it would be wise to sew in the mattress and pillows with a light rubber sheeting; this sheeting should then be washed once a week. This procedure is beneficial in many cases, probably because it markedly decreases the amount of house dust and fungi. The home should be kept clean with an electric vacuum cleaner; no sweeping or dusting should be permitted.

It is important, of course, to keep the bowels open, but there are no authentic data that show a relationship between bowel infection and bronchial asthma; vaccines prepared from fecal

organisms have given disappointing results. When success has followed such a vaccine the results are probably due to a nonspecific protein action and, in common with all such nonspecific methods of therapy, the results are only temporary in the vast majority of cases. Vaccines from the sputum offer a better chance of success, but here also the results usually are only temporary. A useful prescription for many cases of bronchial asthma consists of apomorphine hydrochloride 0.13 Gm,. potassium iodide 20 Gm., and sufficient syrup of sarsaparilla to make 120 cc. The dosage is a teaspoonful every four hours.

The potassium iodide loosens the sputum and the apomorphine is an excellent expectorant. For severe attacks, subcutaneous administration of epinephrine hydrochloride in doses of from 0.5 to 1 cc. of the 1:1,000 solution is still supreme. Morphine should not be given except in a few cases in which epinephrine and other drugs have failed; and, when used, morphine should be injected in small doses with a great deal of caution. Some fatalities have followed the combined use of morphine and epinephrine. Ephedrine by mouth is often very efficient. The main problem here, however, is to find the cause and thoroughly eliminate it if possible, and to desensitize to those important causes which cannot be completely eliminated.

MUSCLE TWITCHING AFTER DEATH AND RIGOR MORTIS

To the Editor:—I was called recently to see a patient who had apparently been overcome by heat. He was a man, aged 41, of robust build, a heavy drinker of intoxicants, who had been in good health up to the day on which I was called. While doing heavy manual labor in the hot sun, he fell unconscious and on my arrival one hour later was still unconscious, almost pulseless. Blood pressure was 50 systolic, 30 diastolic; temperature was 108 F., and breathing was labored. His condition gradually got worse and he died in about half an hour in spite of stimulants and an ice bath. The interesting feature about this case and concerning which I would appreciate your opinion is the following: For at least forty-five minutes after this man appeared to be dead by the usual criteria, as absence of breathing and heart tones and the mirror test, there were spontaneous movements of the limbs, as flexing and extending the fingers, bending the knees slightly, and quivering of the tendons of the wrists and arms. The body would lie still for as long as ten minutes, and then a knee would rise as much as 2 inches from the bed or the fingers would move. The case was discussed with several physicians. Some say that such movements are possible post mortem in those dying of thermic fever or delirium tremens. The others maintain that these movements indicated that some spark of life was still present, that the movements would not have been possible if death had actually taken place, and that attempts at resuscitation should be continued as long as these movements continued. I would greatly appreciate your opinion on this question. If it is printed in the columns of THE JOURNAL, kindly omit my name and address.

M.D., Wisconsin.

ANSWER.—Spontaneous, fibrillar contractions of the muscles occur occasionally soon after death, especially in muscular individuals who die suddenly or after a very brief illness. High temperatures favor these contractions. A well known phenomenon is the fibrillation of the appendix of the right auricle of the heart, which may be observed even several hours after death (ultimum moriens Halleri). At necropsy, when the skin is being removed from the chest, fibrillar twitchings of the bundles of the serratus and major pectoral muscles are frequently seen. Rigor mortis too has to be taken into consideration and rigor mortis is apt to set in early on hot days. Since rigor mortis does not affect all muscles simultaneously but one group of the muscles after the other, certain movements may result, such as the rising of an arm or limb or a closing of the mouth. From the symptoms described there are no indications that the patient was still alive when pronounced dead.

HIGH DIASTOLIC BLOOD PRESSURE

To the Editor:—I have been unable to find in any of the textbooks a precise and logical explanation for the cause and significance of a high diastolic blood pressure. What is the pathologic basis and why is it considered a symptom of severe heart damage? Please omit my name.

M.D., California.

ANSWER.—High diastolic pressure may be found in essential hypertension, in chronic nephritis, in chronic lead poisoning, in some instances of increased intracranial pressure, as when a tumor presses on the medulla, in coarctation of the aorta, and in the rare cases of tumor of the suprarenal gland and pituitary basophilism. The immediate cause of high diastolic pressure is believed to be an increased tone of the peripheral blood vessels, especially the arterioles. The exact cause of the persistent increase of arteriolar tone is not known. Usually, though not always, arteriosclerosis and arteriolosclerosis are associated. When there exists a tendency toward arterial change, the development of arteriosclerosis is aided by the hypertension. The resultant organic narrowing of the peripheral vascular bed is contributory to the development of a high diastolic pressure. Hypertrophy of the heart follows, invariably accompanied by some disease of the coronary arteries, often of an advanced degree. Cardiac irregularities, especially extrasystoles, may make their appearance; in some, auricular fibrillation develops, although usually not until late in the disease. Finally, signs of congestive heart failure become manifest. Thus, it is apparent that a high diastolic blood pressure should not be considered "a symptom of severe heart damage"; rather, severe heart damage may follow as a consequence of the hypertension, or of the associated coronary arteriosclerosis, or both.

DERMATITIS IN GLASS WOOL INDUSTRY—SALT IN HEAT EXPOSURE

To the Editor:—I have been doing some industrial work for a firm that makes glass wool. Minute particles of glass collect on the workers' skin and, together with the intense heat, produce a dermatitis, which is very irritating and difficult to combat. These men are required to take a shower at the end of the shift, but the cases of dermatitis continue. From the sketchy details given could you suggest treatment? What is the best and most economical method of treating drinking water for use in hot weather? We are using salt tablets. Could you recommend or suggest a modern textbook on industrial medicine?

H. A. CAMPBELL, M.D., Newark, Ohio.

ANSWER.—The dermatitis described is essentially the result of mechanical action on skins made more susceptible to injury through profuse sweating. The problem is not one of treatment but of prevention of further exposure. Exhaust systems should be installed wherever practically adaptable to the entrainment of small glass particles. Protective garments worn by workers will serve as a barrier against contact with these glass slivers, but in hot weather it is not always feasible to wear gauntlets and neck cloths, because of obvious discomfort. The application of water soluble soap to the skin when dry will provide some protection but may not prove to be entirely adequate to the situation.

The use of salt tablets in drinking water supplied for the purpose of replacing the chloride losses in perspiration has proved satisfactory and economical. Certain objections may be raised to the ingestion of large tablets of salt as being less desirable from a hygienic point of view than the intake of saline solution or loose salt. However, under industrial conditions the use of tablets has proved more expedient.

Below are listed several publications on industrial medicine and hygiene:

Dr. Alice Hamilton's "Industrial Toxicology," New York, Harper & Brothers, 1934 (contents mostly limited to occupational diseases).

Dr. Alice Hamilton's "Industrial Poisons in the United States," New York, Macmillan Company, 1929 (similar, but larger volume).

Kober and Hayhurst's "Industrial Health," Philadelphia, P. Blakiston's Son & Co., 1924 (standard textbook on occupational diseases with extensive information on industrial hygiene and industrial medicine).

Dr. Carey P. McCord's "Industrial Hygiene for Engineers and Managers." New York, Harper & Brothers, 1931 (primarily devoted to industrial hygiene, with chapters on industrial medicine and occupational diseases).

USE OF DINITROPHENOL

To the Editor:—A white woman, aged 33, married, has been under my care since Feb. 19, 1934, for the treatment of obesity. Her height is 5 feet 5 inches (165 cm.) and her original weight was 236 pounds (107 Kg.). Dinitrophenol sodium (Eastman Kodak) was used; the original dose was 1½ grains (0.1 Gm.) three times a day, later increased to the same amount four times a day. The patient lost 31 pounds (14 Kg.) in the period from February 19 to July 15. During this period she showed no untoward effects. Perspiration was marked. Since July 15 the loss of weight has ceased and there has been a gradual gain of weight, amounting at present to 8 pounds (3.6 Kg.). This has been associated with cessation of perspiration and constipation. The drug is potent, since some of the same batch is effective on other patients. There has been no limitation of the diet. Your suggestions will be greatly appreciated. Should the dose be increased? Kindly omit name.

M.D., Connecticut.

ANSWER.—Some patients who have been given dinitrophenol for long periods may develop a partial tolerance to the drug. In this patient medication should be stopped for two weeks, and then treatment resumed with a dose of 0.1 Gm. three times a day. After two weeks of this dose, if weight loss is not secured, the dose may be increased again to 0.1 Gm. four times a day, or if it proves necessary, even to as high as a total of 0.65 Gm. daily. The symptomatic response is the best guide as to the upper limits of dosage. It should not be overlooked that weight control is fundamentally a problem of balancing food intake against its use as energy. If the patient uses the medication as an excuse for greatly increased food intake, no reduction drug can be successful. It would therefore be

better to establish this patient on an adequate but not excessive diet before resuming the dinitrophenol medication. In many cases this measure permits the use of much smaller doses of dinitrophenol.

CASTOR OIL AND QUININE FOR THE INDUCTION OF LABOR

To the Editor:—A patient, several days overdue, was given castor oil and quinine to induce labor, after taking which she did not feel any fetal movements. After twenty-four hours she started in labor and at this time no fetal heart tones could be heard. A normal baby was born which to all appearances had been dead from twenty-four to thirty-six hours. Are there any cases on record in which castor oil and quinine have caused the death of the fetus when given at full term? The mother had no idiosyncrasy to quinine sulphate, but no cause except the medication could be found for the death of the baby. What is the general opinion of the profession in using this method of inducing labor? Kindly omit name.

M.D., Michigan.

ANSWER.—There seems to be not a little evidence that castor oil and quinine sometimes cause the death of the fetus in utero, though it is not easy to prove the fact since occasionally, when the gravida goes over term, the fetus dies without apparent cause.

Gellhorn (*Am. J. Obst. & Gynec.* **13**:779 [June] 1927) claims that quinine can be fatal to the fetus, and more recently E. L. King of New Orleans has said the same. It is not known how this comes about. Some uteri react to quinine but most do not, and there has been no proof that tempestuous uterine contractions regularly follow the quinine in the cases in which the child has died. A frequent finding has been meconium-discolored liquor amnii.

In the case cited it seems as if quinine (or perhaps the oil) caused the death of the fetus

The dose of quinine should be reduced to a single capsule of 0.2 Gm., or 3 grains.

USE OF SCHILLING DIFFERENTIAL HEMOGRAM

To the Editor:—Are there any large cities in the United States using (with confidence) the Schilling differential count other than St. Louis? It is being used as a routine in several large hospitals in St. Louis. What, in general, is the Association's opinion of the procedure? What literature references other than Gradwohl's translation of "The Blood Picture" by Schilling can you give me? I shall greatly appreciate any information you may be able to furnish me.

R. C. PETERS, M.D., Kirkwood, Mo.

ANSWER.—Schilling began the writing of his simplified index in 1911. By 1925 his method was in common use in Germany and many European clinics. During the past few years the method has come into use in this country. Many large cities other than St. Louis use the Schilling hemogram. It must not be assumed, however, that this method or any other laboratory procedure is a short cut in the formulation of a clinical diagnosis. It is a valuable source of information when intelligently used, and by adding another feature to the mosaic which in its entirety represents a diagnosis or a prognosis, it is of distinct value. Excellent discussions on the theory and application of the Schilling hemogram may be found in

Pepper, O. H. P., and Farley, D. L.: Practical Hematological Diagnosis, Philadelphia and London, W. B. Saunders Company, 1933.
Reznikoff, Paul: Immature White Blood Cell Counts in Infectious Diseases, THE JOURNAL, Sept. 28, 1929.
Piney, Alfred: Recent Advances in Hematology, Philadelphia, P. Blakiston's Son & Co., 1927.
Reznikoff, Paul: White Blood Cell Counts in Convalescence from Infectious Diseases, Am. J. M. Sc. **184**: 167 (Aug.) 1932.

OPERATIVE PROCEDURE IN COLITIS

To the Editor:—A man, aged 35, has suffered for four years from mucous colitis, during which time he has been treated with diathermy, autogenous vaccines and whatnot, but with no success. Finally in 1932 he was advised to consent to an operation. A colostomy was performed in August 1932. Since then he has put on weight and looks and is perfectly healthy, his only complaint being a constant mucous discharge from the rectum. The family history and personal history are essentially negative. What can you tell me regarding the prognosis in a case of this sort, and is there any hope for a resection? If there is, how long after operation is such possible? Kindly omit name.

M.D., New York.

ANSWER.—Colostomy is rather unusual treatment for "mucous colitis." Colostomy occasionally has been performed for chronic ulcerative colitis, when the disease is limited to the distal segments of the large intestine and associated with unusual stricture or fistula. Whether or not resection could be done would depend on the activity and complications of the disease. If the lining of the bowel seems to be in fairly good condition and the lumen is reasonably roomy, the colonic stoma might be closed. If resection becomes necessary, it is well to wait until the active disease in the lower segments of the intestine has subsided.

PILONIDAL CYST OR FISTULA IN ANO

To the Editor:—A traveling salesman, aged 35, otherwise in perfect health, has anal fistula of ten years' standing. He has no pain except when hairs grow into an opening, and only a small discharge occasionally. But at different times there has been a discharge from five or six different openings. I hesitate to attempt the classic operation owing to the extent of mutilation probably necessary with loss of time and danger of failure of some kind. I wonder whether it is worth while to try autogenous vaccine or nonspecific protein with or without a purse-string or temporary mucous flap for the rectal opening. Also, what is the danger in delay? Does recovery ever occur spontaneously? Current literature on this subject seems to be scarce. I would like as much information as you can give in this column. Please omit name.

M.D., Wisconsin.

ANSWER.—The description of the condition suggests pilonidal cyst with multiple openings. If this is the case, there is no communication with the anal canal and the treatment consists in a wide excision of all tracts and the cyst itself. If, however, the condition is a complicated fistula in ano with multiple openings, radical surgery is the only method that offers any possible chance of cure. This consists in a careful dissection of all the tracts and going through the sphincter at the point where the tract enters the anal canal. All the tracts must be left open to granulate in by themselves; otherwise there would be a recurrence of the condition.

SURGICAL REPAIR OF OLD PERINEAL LACERATION

To the Editor:—What is the preoperative and postoperative care for an old complete laceration of the perineum in a woman, aged 38, who has had the condition for eighteen years? Continence of feces is maintained by a band of scar tissue. In the repair should this band of scar tissue be sacrificed and the torn sphincter ends brought together, or would you retain the band of scar tissue and rebuild the perineal body above it? What percentage of such old cases are successfully repaired by bringing the torn sphincter ends together? Kindly do not mention name.

M.D., New York.

ANSWER.—Preoperative care is unnecessary except for a simple enema, which should be given not later than four hours preceding operation.

The supporting band that maintains continence may perhaps be spared. The preliminary incision is preferably made high and sufficiently curved laterad to the anus to permit the dissection downward of a short wide flap over the anus. Extensive denudation and repair of the perineum constitute a prominent feature in the procedure. Bringing together the torn sphincter ends is helpful but is a lesser factor and does not usually suffice unless there is a coincidental perineal repair. An illustrated description of the technic will be found in Curtis's Textbook of Gynecology, ed. 2, page 272.

THYROXINE OR DESICCATED THYROID

To the Editor:—In case there was a deficiency of the thyroid such as after thyroidectomy, which would be the best to give, and why, thyroxine or desiccated thyroid? I do not mean to consider the cost. Please omit name.

M.D., Utah.

ANSWER.—Desiccated thyroid would be superior because it contains all the thyroid secretion and has been found to possess greater calorigenic activity than an amount of thyroxine of equal iodine content when administered by mouth. This is attributed both to the existence in desiccated thyroid of a thyroxine-peptide complex (Harington and Salter, *Biochem. J.* **24**:456, 1930) which is more soluble than thyroxine and possibly less readily destroyed in the digestive tract and also to the activation or transformation of diiodotyrosine, which is an important normal constituent of the thyroid gland. It is to be supposed that as replacement therapy the desiccated thyroid containing both these substances would more nearly serve as a complete substitution product.

ENDEMIC GOITER

To the Editor:—Is Forest Park, Pa., in a goiter belt? Is the condition aggravated when patients with hyperthyroidism move into a goiter district? The patient whom I have in mind has hyperthyroidism and wishes to go on her vacation to Forest Park, Pa., and has sought my advice on that point. Please omit name.

M.D., New York.

ANSWER.—Forest Park, Pa., is not in what could be called a goiter belt, although endemic goiter does occur there. The incidence of toxic goiter does not run parallel to that of endemic goiter. In some regions where there is more endemic goiter there is less toxic goiter, but this is not everywhere true. There is no reason to think in this case that the hyperthyroidism would be aggravated by a change in locality such as that mentioned. More would depend on the amount and nature of the rest obtained during the vacation.

associated. When there exists a tendency toward arterial change, the development of arteriosclerosis is aided by the medication as an excuse for greatly increased food intake, no reduction drug can be successful. It would therefore be

OXYURIS VERMICULARIS

To the Editor:—Please send me information with regard to the treatment of adult infestation with Oxyuris vermicularis by means of aluminum subacetate. My patient is a man, aged 35, who has been infested for a period of ten years. According to my information, aluminum subacetate is the best treatment over a period of time. If it is your opinion that other medication would be more effective, will you please outline such treatment? Please omit name and address.

M.D., New York.

ANSWER.—It is not probable that solution of aluminum subacetate is any more efficient than would be any other astringent, such as tannic acid solution, because the adult females, the only ones that can be reached by this treatment, are dislodged without difficulty from the anus and rectum by almost any form of enema. The young parasites, on the other hand, which inhabit the small intestine, are not reached by any other treatment than by anthelminthics, such as santonin, oil of chenopodium, or tetrachloro-ethylene taken by mouth. Santonin is given in doses of 0.01 Gm. for each year of age not to exceed an adult dose of 0.2 Gm. It is best to give one dose daily for a week. Tetrachloro-ethylene is at present preferred to oil of chenopodium. It is given in 0.5 cc. capsules, in an adult dose of 2 to 3 cc., followed in two hours by a saline purge such as sodium sulphate. As it may cause transient dizziness, the patient is best confined in bed for the day. Colon irrigations should be combined with the internal treatment, and quinine sulphate 1:1,000 solution is probably as good as any other agent.

PREPARATION OF CADAVERS

To the Editor:—In Queries and Minor Notes in THE JOURNAL, Oct. 7, 1933, page 1173, the preparation of cadavers for dissection in tropical countries is described. Is it necessary to use this solution of phenol, glycerin and alcohol in this country? If this solution is used for injection, can the immersion of the cadaver in a solution of 3 per cent phenol and water be eliminated? I do not plan to prepare a cadaver for dissection until the latter part of October, when it should be a little cooler here. Would this make a difference in the preparation? To save you looking this town up on a map, I want to tell you that it is located in southern Texas about 60 miles west of Brownsville.

LLOYD M. SOUTHWICK, M.D., Edinburg, Texas.

ANSWER.—It is absolutely necessary to use this solution or some similar one anywhere in this country. This one contains no arsenic; the use of arsenic for this purpose is prohibited in several states. If the cadaver is to be completely dissected within three months, immersion is not absolutely necessary; covering, when not being dissected, with wet cloths, and a big oilcloth sheet may be substituted.

VENOUS ECTASIA OR MELANOMA

To the Editor:—A man, aged 60, suddenly developed two bluish discolored areas on the inner margin of the lower lip, about 0.125 mm. in diameter. These spots are perfectly flat, are not tender, and can be made to change color slightly on pressure. They are slightly larger than a year ago when they first appeared, but two more similar spots have appeared under the upper lip.

M.D., Massachusetts.

ANSWER.—The differential diagnosis lies between venous ectases and metastatic melanoma. The statement that the spots change color on pressure favors the diagnosis of vascular lesions, and the probabilities also weigh on that side; but the problem is so important that it is deemed best to have the case carefully studied by a specialist before treatment is instituted.

If, as seems probable, the decision is in favor of the venous dilatations, radium can be used with good results: a half strength plaque screened with 0.1 mm. of lead and applied for three periods of an hour each on three days within the same week. This may be repeated after an interval of a month or six weeks.

IMPETIGO

To the Editor:—During the last few months I have seen several cases of a skin lesion that resembles impetigo. Most of the patients are girls of the upper grade or high school ages. The lesions are scattered with no particular arrangement, but the hands and face are particularly affected. They resemble impetigo, but the crusts are not so heavy and the discharge is rather less purulent than in impetigo. Sometimes they itch considerably. The individual lesions are very persistent but finally clear up, leaving pigmented areas that are very disfiguring. They are very resistant to treatment. It seems to me that they clear up in spite of, and not because of, any medication, though I have tried all the usual agents. Have you any suggestions as to what it is and what to do for it?

E. R. HUCKLEBERRY, M.D., Garibaldi, Ore.

ANSWER.—There is little doubt that the condition described is impetigo contagiosa. The discharge in impetigo is more often thin and straw colored than purulent, and the crusts are not necessarily heavy. The itching is typical. The resistance to treatment, however, is unusual. The crusts should be removed with warm water and soap; a saturated solution of boric acid is applied and then a 5 per cent ointment of ammoniated mercury. Short exposures to ultraviolet rays will hasten the cure. Five per cent silver nitrate solution is recommended in resistant cases.

NORMAL AND ABNORMAL TEMPERATURE

To the Editor:—I would appreciate very much your giving me the following information: What is normal temperature? What is the highest temperature to be considered normal in adult males? In adult females? In children? Is there such a thing as a physiologic temperature running higher in certain individuals which is normal for them? If so, how is it determined and how much elevation has been recorded in such individuals?

J. D. RILEY, M.D., State Sanatorium, Ark.

ANSWER.—The normal temperature of man and of woman averages 37 C. (98.6 F.) and 37.1 C. (98.78 F.) except for the first week of life. Axillary temperatures have been correlated with age, as follows:

In the first ten days	37.75 C. (99.95 F.)
Ten days to puberty	37.43 C. (99.39 F.)
Fifteenth to twentieth year	37.19 C. (98.94 F.)
Twenty-first to seventieth year	36.85 C. (98.33 F.)
Eightieth year	37.26 C. (99.06 F.)

The extreme variation in this table is 1.43 degrees F. The table also answers the question of the temperature of children. The variations being normal for the various age groups, individuals apparently enjoying good health have been known to have temperatures higher than those given. However, no deviation greater than 1.8 degrees F. is to be considered normal (Hewlett). A rectal temperature above 37.2 C. (98.96 F.) is considered by some as evidence of disease.

CHILD WITH CONGENITAL SYPHILIS

To the Editor:—Should a child with congenital syphilis untreated be excluded from attending public school?

EDWARD JOYCE, M.D., Hurley, S. D.

ANSWER.—In general, no. Children with prenatal syphilis by the time they reach school age no longer present infectious lesions even though untreated. Their attendance at school should be encouraged in every way possible, for they are frequently somewhat above the ordinary in intelligence, and disabilities and handicaps in the form of intercurrent complications such as interstitial keratitis should be compensated for in every possible way so far as the child's education is concerned. It is particularly inhuman and quite unnecessary from the public health standpoint to add to the burdens of these children either stigmatization or the loss of intellectual opportunity by exclusion from school.

CLEFT PALATE

To the Editor:—In cases of inoperable cleft palate, at what age and how successfully can dentures be used to close the cleft? How often do they have to be changed and is the average "good dentist" able to handle such an assignment? The patient I have in mind was taken to one of America's leading medical men in this line a few months after birth. He did not believe operation advisable at that time and told the parents to bring the child back at the age of 18 months. They brought the baby back and he told them to wait two years more. The cleft does not appear to be closing up at all. The two year period has about elapsed.

PAUL R. HOWARD, M.D., Monmouth, Ill.

ANSWER.—It is hardly practical to fit a plate in an open palate before the six year molars erupt. The question arises as to whether this is an inoperable case. Most of these patients can be operated on to advantage between the age of 1 and 2 years; there are a few that have a much better chance of success if operation is postponed until the first molar teeth are fully erupted, or even until the six year molars have erupted.

Any man doing general dentistry who would take sufficient interest in the case would be capable of handling it if the age and conditions are suitable for a plate.

SEBACEOUS CYSTS

To the Editor:—I would appreciate information concerning the destruction of sebaceous cysts on the lobule and areolar portions behind the ear. Are there any satisfactory sclerosing agents that may be injected? Would fulguration or desiccation currents be of any value?

D. C. MALCOLM, M.D., Onaga, Kan.

ANSWER.—At times roentgen treatment will cause small sebaceous cysts to disappear. From four to eight treatments are required at weekly intervals. The dose is approximately 75 roentgens. Either filtered or unfiltered radiation may be used. This amount of treatment is safe. Unfortunately, the effect on the cyst is uncertain. Radium may be used instead of x-rays.

has subsided.

as that mentioned. More would depend on the amount and nature of the rest obtained during the vacation.

Surgical diathermy may be used. One way to use this method is to make a small opening into the cyst with the cutting current and a needle electrode. Then the inner surface of the cyst wall is electrodesiccated. Surgical diathermy may be followed by considerable reaction, sloughing and, perhaps, an objectionable scar. At times the result is excellent.

The injection into the cyst of sclerosing substances after the contents of the cyst have been evacuated, substances such as phenol (carbolic acid) or a concentrated solution of trichloracetic acid, may effect the desired result, but not infrequently a discharging sinus remains.

Many believe that the best method is scalpel excision with healing by first intention.

NEURITIS OF VULVA

To the Editor:—I have under my care a woman, aged 58, who complains of vulval pain. The pain seems to be localized in the soft parts. Physical examination is absolutely negative as far as I can ascertain. Would you be kind enough to outline the possibilities and the treatment advised? Please omit name.

M.D., District of Columbia.

ANSWER.—Pain in the soft tissues of the vulva, independent of a demonstrable lesion, is not uncommon. Neuritis is the most frequent cause. Alcohol injection relieves some cases. Nerve resection is occasionally advisable.

In making certain that there is no local pathologic condition, it is essential to rule out sensitive areas at the orifices of the Bartholin gland ducts, as well as tender caruncles, minute lesions caused by repeated traumatism at intercourse, and discomfort incident to a small rectocele. Many patients are entirely relieved of vulval sensitiveness after learning that entrance into the vaginal canal should be made with care not to traumatize the anterior wall; pressure posteriorly seldom causes discomfort.

PROPHYLAXIS OF SEED WARTS

To the Editor:—The superintendent of schools informs me that the physical director is finding many seed warts among the high school pupils, especially among the girls. They have scrubbed the gymnasium floor each day and had the pupils immerse their feet in a solution of corrosive mercuric chloride. Can you give me any information regarding prophylactic treatment for this condition?

M.D., Iowa.

ANSWER.—Since the etiology of "seed warts" is obscure, the prophylaxis is somewhat indefinite. Various investigators have been able to produce warty lesions by inoculation, and it is believed that the infected organism is a filtrable virus and that injury is necessary for the portal of entry. For prophylaxis, Hazen suggests mopping the surface with a saturated solution of salicylic acid in alcohol. If this cannot be borne, the use of alcohol alone also seems to be beneficial.

EPHEDRINE FOR DILATING PUPILS

To the Editor:—Please give me information on what strength ephedrine solution to use for dilating pupils in presbyopia.

ROBERT MONFORT, M.D., Cheboygan, Mich.

ANSWER.—From 5 to 10 per cent of the salts of ephedrine.

BILATERAL EPIDIDYMITIS

To the Editor:—In Queries and Minor Notes in THE JOURNAL, October 6, I noticed a communication on bilateral epididymitis and signed M.D., Colorado. In the treatment outlined I saw no mention made of the use of diathermy. In my experience I have found no other therapy that gives such satisfactory results in epididymitis. I use the Wappler epididymitis clamp, applied laterally to both testicles, with plenty of soap suds to make a good connection. I give one half to three quarters of an hour treatments daily and follow each treatment with an intravenous injection of 5 cc. of a 10 per cent solution of calcium chloride (ampules). I continue this treatment for a month if necessary. The testicles will return to normal size, leaving practically no nodulation in the epididymis. I use a current strength of from 750 to 1,200 milliamperes, beginning with the former and gradually working up. I mention the Wappler clamp because it permits of adjustment to any sized swellings and is perfectly insulated so that the patient very quickly learns to carry out the treatment himself.

CHESTER H. WOOLSEY, M.D., San Francisco.

HYDROCHLORIC ACID IN HAY FEVER

To the Editor:—In the answer to the query on hydrochloric acid in hay fever, on page 938 in THE JOURNAL, September 22, you mention the prescription in the *Journal of Allergy* in September 1930. In the *American Journal of the Medical Sciences* for October 1927 a similar prescription is given and, as I remember it, this was not news at that time. I have used the prescription at times with good results.

J. K. WILLIAMS WOOD, M.D., Willow Grove, Pa.

Council on Medical Education and Hospitals

COMING EXAMINATIONS

ALABAMA: Montgomery, Jan. 7. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written (Group B candidates).* The examination will be held in various cities throughout the country, April 29. *Oral (Group A and Group B candidates).* New York, June 10. Sec., Dr. C. Guy Lane, 416 Marlborough St., Boston.

AMERICAN BOARD OF OPHTHALMOLOGY: Philadelphia, June 10. Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

ARIZONA: *Basic Science.* Tucson, Dec. 18. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson. *Medical.* Phoenix, Jan. 2-3. Sec., Dr. J. H. Patterson, 320 Security Bldg., Phoenix.

CALIFORNIA: *Reciprocity.* Los Angeles, Dec. 5. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: *Endorsement.* Hartford, Nov. 27. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden.

DELAWARE: Wilmington, Dec. 11-13. Sec., Dr. Harold L. Springer, 1013 Washington St., Wilmington.

DISTRICT OF COLUMBIA: *Basic Science.* Washington, Dec. 27-28. *Medical.* Washington, Jan. 14-15. Sec., Commission on Licensure, Dr. W. C. Fowler, 203 District Bldg., Washington.

KANSAS: Topeka, Dec. 11-12. Sec., Dr. C. H. Ewing, Larned.

KENTUCKY: Louisville, Dec. 4-6. Sec., State Board of Health, Dr. A. T. McCormack, 532 W. Main St., Louisville.

LOUISIANA: New Orleans, Dec. 6-8. Sec., Dr. Roy B. Harrison, 1507 Hibernia Bank Bldg., New Orleans.

MARYLAND: *Regular.* Baltimore, Dec. 11-14. Sec., Dr. Henry M. Fitzhugh, 1211 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 11-12. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MINNESOTA: *Basic Science.* Minneapolis, Jan. 2-3. Sec., Dr. J. Charnley McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Medical.* Minneapolis, Jan. 15-17. Sec., Dr. E. J. Engberg, 350 St. Peter St., St. Paul.

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II.* The examinations will be held in medical centers where there are five or more candidates, Feb. 13-15. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NEBRASKA: *Basic Science.* Omaha, Jan. 8-9. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NORTH CAROLINA: *Endorsement.* Raleigh, Dec. 3. Sec., Dr. Benj. J. Lawrence, 503 Professional Bldg., Raleigh.

NORTH DAKOTA: Grand Forks, Jan. 1-4. Sec., Dr. G. M. Williamson, 4½ S. 3d St., Grand Forks.

OHIO: Columbus, Dec. 3-6. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: *Reciprocity.* Oklahoma City, Dec. 11. Sec., Dr. J. M. Byrum, Mammoth Bldg., Shawnee.

OREGON: Portland, Jan. 2-4. Sec., Dr. Joseph F. Wood, 509 Selling Bldg., Portland.

PENNSYLVANIA: Philadelphia, Jan. 8-12. Sec., Board of Medical Education and Licensure, Mr. W. M. Denison, 400 Education Bldg., Harrisburg.

RHODE ISLAND: Providence, Jan. 3-4. Dir., Public Health Commission, Dr. Lester A. Round, 319 State Office Bldg., Providence.

VIRGINIA: Richmond, Dec. 12-14. Sec., Dr. J. W. Preston, 803 Medical Arts Bldg., Roanoke.

WASHINGTON: *Basic Science.* Seattle, Jan. 10-11. *Medical.* Seattle, Jan. 14-16. Dir., Department of Licenses, Mr. Harry C. Huse, Olympia.

WISCONSIN: *Basic Science.* Milwaukee, Dec. 15. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. *Medical.* Madison, Jan. 8-10. Sec., Dr. Robert E. Flynn, 401 Main St., LaCrosse.

Massachusetts March Examination

Dr. Stephen Rushmore, secretary, Board of Registration in Medicine, reports the oral and written examination held in Boston, March 13-15, 1934. The examination included 64 questions. An average of 75 per cent was required to pass. One hundred and fifty-one candidates were examined, 66 of whom passed and 85 failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Yale University School of Medicine		(1928)	75
Georgetown University School of Medicine		(1932)	75, (1933) 75, 75
Tulane University of Louisiana School of Medicine		(1920)	75, (1932) 75
Johns Hopkins University School of Med		(1930)	75, (1932) 75
University of Maryland School of Medicine and College of Physicians and Surgeons		(1927)	77.8
Boston University School of Medicine		(1931)	76.6, (1933) 75, 75
College of Physicians and Surgeons, Boston		(1933)	75
Harvard University Medical School		(1930)	80, (1931) 78.4, 83.8, (1932) 77.3, 78.2
Middlesex College of Medicine and Surgery		(1929)	75, (1931) 75, 75, 75, 75.2, (1932) 75, 75, 75, 75, 75, 75, 75, 75.2, 75.5, 75.7, 76.5
Tufts College Medical School		(1932)	80.3, (1933) 75, 75.6, 75.7, 77.2, 77.8, 78.7, 79, 81, 81
Kansas City University of Physicians and Surgeons, Missouri		(1932)	75.2, 78.8
University of Nebraska College of Medicine		(1927)	79.6
New York University, University and Bellevue Hospital Medical College		(1932)	75
Syracuse University College of Medicine		(1931)	75.3
Hahnemann Med. College and Hospital of Philadelphia		(1931)	75, (1933) 75

not necessarily heavy. The itching is ... to treatment, however, is unusual. The crusts should be ... of x-rays.

School	FAILED	Year Grad.	Per Cent
University of Vermont College of Medicine		(1930)	79.7
McGill University Faculty of Medicine		(1928) 85.8, (1932)	83.1
Regia Università di Napoli Facoltà di Medicina e Chirurgia		(1929)	75.1
University of Edinburgh Faculty of Medicine		(1932)	81.4
Osteopaths *		75, 75, 75, 75.2, 75.4, 75.5, 76, 76,	77.7
Georgetown University School of Medicine		(1933)	68.4, 69, 71
Boston University School of Medicine		(1929) (1933)	70.5, 69.6, 70.8
College of Physicians and Surgeons, Boston		(1931) (1933)	64.5, 67, 68.7, 69.1
Middlesex College of Medicine and Surgery		(1921) (1923) 59.7, (1924) 65.2, (1925) 54, (1926) 53.2, 71.6, (1928) 55.7, 66.8, (1929) 55.8, 60.5, 63.1, 63.8, 70.7, 72.1, (1930) 62.6, 63.7, 65.3, 70, (1931) 53.1, 58.5, 65.4, 69, 70.6, 72, 72.3, (1932) 60.7, 62.3, 63.8, 64.2, 66.5, 66.7, 66.9, 68.7, 70.7, 70.8, 71.5, 72.7	49.4,
Kansas City University of Physicians and Surgeons, Missouri		(1929) 48.2, 57.1, (1930) 67.3, (1931) 72, (1932) 52, 66.2, 68.6, 69.5, 70.6, 73.3, (1933) 39, 46.6, 54.7, 68.1, 70.3, 72.5	47,
Missouri College of Medicine and Science		(1927)	67.9
St. Louis College of Physicians and Surgeons, Missouri		(1923)	55.4
Medical College of Virginia		(1930)	71.1
Laval University Faculty of Medicine		(1932)	63.7
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia		(1925)	50.7
Regia Università di Napoli Facoltà di Medicina e Chirurgia		(1932)	53.3
Government Medical School, Teheran, Persia		(1917)†	55.4
Faculté Française de Médecine de l'Université de St. Joseph, Beyrouth, Syria		(1927)†	70.9
Osteopaths*		42.9, 44.5, 55.4, 56.5, 56.5, 58.5, 59.9, 62.5, 62.8, 66.2,	66.7, 69.2, 72.7

One physician was successful at a special examination, held March 15. The following school was represented:

School	PASSED	Year Grad.	Per Cent
University of Michigan Dept. of Medicine and Surgery		(1900)	80

Twenty-seven physicians were licensed by endorsement from January 8 to July 2. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Yale University School of Medicine		(1932)	N. B. M. Ex.
Johns Hopkins University School of Medicine		(1929)	N. B. M. Ex.
Boston University School of Medicine		(1929), (1932, 2)	N. B. M. Ex.
Harvard Univ. Med. School		(1929), (1930, 4), (1931, 5), (1932)	N.B.M.Ex.
Tufts College Medical School		(1931), (1932, 4), (1933, 2)	N. B. M. Ex.
Columbia Univ. College of Phys. and Surgs.		(1930), (1931, 3)	N. B. M. Ex.

* Examined in medicine and surgery.
† Verification of graduation in process.

District of Columbia Reciprocity Report

Dr. W. C. Fowler, secretary, Commission on Licensure, reports 12 applicants licensed by reciprocity from Jan. 29 to July 15, 1934. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington University School of Medicine		(1931)	Maryland
Georgetown University School of Medicine		(1931)	Maryland, Virginia
Howard University College of Medicine		(1930)	Maryland, Virginia, (1931) Georgia, Virginia
Hahnemann Medical College and Hospital, Chicago		(1911)	Iowa
Northwestern University Medical School		(1924)	Iowa
Columbia College, College of Physicians and Surgeons		(1895)	New York
Cornell University Medical College		(1905)	New Jersey
Osteopath			California

South Dakota January Report

Dr. Park B. Jenkins, director, Division of Medical Licensure, reports the written and practical examination held in Pierre, Jan. 16-17, 1934. The examination covered 13 subjects and included 110 questions. An average of 75 per cent was required to pass. Four candidates were examined, all of whom passed. Three physicians were licensed by reciprocity and 1 physician was licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
State University of Iowa College of Medicine		(1932)	86
University of Michigan Medical School		(1931)	84
University of Minnesota Medical School		(1927) 86, (1933)	84

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Rush Medical College		(1932)	Iowa
College of Physicians and Surgeons, Medical Department Kansas City University, Kansas		(1897)	Kansas
St. Louis University School of Medicine		(1914)	Oklahoma

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Rush Medical College		(1932)	N. B. M. Ex.

South Dakota July Report

Dr. Park B. Jenkins, director, Division of Medical Licensure, reports the written and practical examination held in Rapid City, July 17-18, 1934. The examination covered 14 subjects and included 95 questions. An average of 75 per cent was required to pass. Six candidates were examined, all of whom passed. Four physicians were licensed by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Northwestern University Medical School		(1931)	88
University of Minnesota Medical School		(1927)	86
Creighton University School of Medicine		(1928) 87, (1933)	86, 87
University of Nebraska College of Medicine		(1933)	88

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Bennett College of Eclectic Med. and Surg., Chicago		(1915)	W. Virginia
State University of Iowa College of Medicine		(1928)	Iowa
John A. Creighton Medical College		(1906)	Nebraska
University of Nebraska College of Medicine		(1921)	N. Dakota

Book Notices

A Manual of the Practice of Medicine Prepared Especially for Students. By A. A. Stevens, A.M., M.D., Consulting Physician to St. Agnes Hospital, Philadelphia. Thirteenth edition. Cloth. Price, $3.50. Pp. 685, with 16 illustrations. Philadelphia & London: W. B. Saunders Company, 1934.

The fact that this is the thirteenth edition attests the usefulness of this manual. The author has held to his original purpose to give to the book an elementary character and he has not added much to its size, although in this edition a number of new subjects appear for the first time. Some of these are massive collapse of the lung, psittacosis, hyperinsulinism, osteitis fibrosa cystica and agranulocytic angina. It must have been difficult for the author to keep the book so condensed, in view of the many important developments in medicine that have come about since the book was first published in 1892. The material under some subheadings is confined to a few lines, and that gives certain portions of the volume a character suggestive of a medical dictionary. The author has met the same difficulty that many other medical book writers have in that it is almost impossible to include the latest advances in view of the rapidity with which they are made. In the discussion of heat stroke and heat exhaustion, for example, nothing appears to have been said about the use of common salt as a prophylactic, which advance came out of the experience gained in the care of workers who are building the so-called Hoover Dam. The author mentions, however, that in the treatment of heat stroke the intravenous and subcutaneous injection of salt solution has proved beneficial in some cases.

Selected Surgical Papers (1876-1914). By Frederic S. Dennis, M.D., F.R.C.S. In two volumes. Boards. Pp. 940, with illustrations. New York: Privately Printed, 1934.

These selected papers were edited and printed by the author with few changes, and those only mistakes in the original articles. He has two reasons for publishing these as a collection of papers: first, to cover his personal experience during the periods of septic surgery, of the open treatment of wounds, of the antiseptic method of Lord Lister and finally following the advent of asepsis; second, to present in tangible form the history, during the life of a single individual, of the greatest science and art that have been employed in aid of humanity. One reads of the marked improvements in surgery during the period of septic surgery by following sound surgical principles even before antisepsis was known. The treatment of a large series of cases with compound fractures reported in 1884 would be a credit to a modern hospital surgical service. Covering the range of surgery as it was known during the years to the present generation are presented most excellent results for that time, in resections for tuberculosis of the knee, gunshot wounds of the abdomen, open operation on fracture of the patella, ligation for deeply located aneurysms, suprapubic cystotomy, trephining for skull fracture, carcinoma of the breast, gangrene of the lower extremity, brain tumor, and various operations on the gastrointestinal tract. His conclusions reported in 1899 about the operative indications for complications of appendicitis will bear

studying at this time. The breadth of knowledge in surgery as evidenced by his writings is stupendous. The surgical principles that he emphasized are as true today as when written, although the technic has changed. The author has performed a real service in printing in book form this collection of papers. They should be read by the student as well as the surgeon for a broader grasp of surgical principles and for the personal historical facts of the most important surgical era known.

Lærebog i intern medicin. Udgivet af Knud Faber, Peter F. Holst og Karl Petrén. Binder I-IV. Third edition. Paper. Pp. 623, with 194 illustrations; 592, with 136 illustrations; 727 with 149 illustrations; 799, with 106 illustrations. Copenhagen: Gyldendalske Boghandel—Nordisk Forlag, 1927-1934.

This edition of the textbook for internal medicine is written in collaboration by a number of Scandinavian physicians who mostly have used their respective vernaculars in penning their part of the work, so that some chapters are in Danish, others in Swedish and others in Norwegian. The work gives a comprehensive description of each disease in particular and is divided into four volumes.

The first volume treats of infectious diseases and discusses infection in general, immunity and the use of serum therapy, passive immunization and active immunization and their combined employment, serum diagnosis and chemotherapy. Each infectious disease is described extensively, and chronic infections, animal parasites and poisonings by inorganic and organic agents are given in detail.

The second volume gives a thorough description of the diseases of the respiratory system, subdivided into diseases of the buccal cavity, the throat and the nose, diseases of the bronchi and the lungs, tuberculosis and diseases of the pleura; then diseases of the circulatory system, the mediastinum and the spleen, and the hemorrhagic diatheses. Tuberculosis is described under the headings of tuberculosis of the lungs and miliary tuberculosis, and in the chapter on the diseases of the circulatory system reproductions of electrocardiograms and schematic curves help to clarify the text.

The third volume describes the diseases of the digestive tract, subdivided into diseases of the esophagus, the stomach and the intestine; the diseases of the peritoneum, of the pancreas, of the liver, the gallbladder and the portal vein; the hematogenous medical diseases of the kidneys and the localization renal diseases; the diseases of the renal pelvis and of the urinary bladder; the diseases of the endocrine glands, and the avitaminoses. The diseases of the endocrine glands are thoroughly discussed and the chapter on avitaminosis is unavoidably short, while the diseases of the digestive system and of the kidneys are given the place of honor and are described competently and minutely.

The fourth volume treats of the diseases of the nervous system, the diseases due to disturbances of metabolism and the diseases of joints and muscles. It is quite natural that the diseases of the nervous system occupy the largest part of the volume; they are competently and completely described and are subdivided into organic nervous disorders, extrapyramidal diseases, diseases of the peripheral nerves, trophovasomotor neuroses, epilepsy, migraine and constitutional psychopathies. The diseases due to disturbances of metabolism are ably presented and the treatment of the diseases of the joints and muscles includes chapters on hydrotherapy and light therapy. The volume closes with a chapter on roentgen therapy in internal medicine. This textbook presents an imposing aspect on account of its size, it covers completely the whole field of internal medicine, it has been written by able physicians, it is beautifully edited, and it offers a profusion of excellent illustrations. It is unfortunate that the language difficulty prevents its general use among students and physicians.

Volumetric Analysis. By H. P. Starck, M.A., Head of the Science Department, the Technical College, Kingston-on-Thames. Cloth. Price, $3. Pp. 259, with 11 illustrations. Baltimore: William Wood & Company, 1934.

The author gives a detailed presentation of the methods and problems of volumetric analysis and lists a variety of determinations. The subject is introduced by a brief description of volumetric apparatus and of the properties of the chief acid reagents used. Next a chapter is concerned briefly with the source and properties of the most common indicators. Since the book is evidently primarily written for the beginning student, the theory of indicators is confined to a seven page chapter. The volume is then further divided into sections on acidimetry and alkalimetry, oxidation and reduction, precipitation methods, and some applications of these methods.

Sets of problems follow each of the main sections of the book. Ample illustrations are given of the various types of reactions. Almost all equations, however, are presented from a molecular point of view; no attempt is made to give ionic reactions. Special determinations intended for pharmaceutic students are indicated with Latin titles in parenthesis; some of the more difficult determinations with potassium permanganate, iodine and some others are set aside for "degree" and "advanced" students. The uses of potassium iodate and titanous chloride, as well as of each of the common oxidizing agents, are detailed in separate chapters. Finally, a brief chapter is devoted to explanation of volumetric processes in the estimation of two or more substances in a mixture or solution. Laboratory directions, especially for the beginner, are for the most part written into the text in the same type as explanatory material and aid in combining theory with practice, a procedure often neglected by students. Much care is taken to indicate clearly the stoichiometric relations involved between the reagent solution and the end product sought. In this manner the text also serves as a good reference work for the beginning student.

Papers of Charles V. Chapin, M.D.: A Review of Public Health Realities. Selected by Frederic P. Gorham, A.M., Sc.D. Edited by Clarence L. Scamman, M.D. With a foreword by Haven Emerson, M.D. Cloth. Price, $1.50. Pp. 244. New York: Commonwealth Fund; London: Oxford University Press, 1934.

The collected papers of Dr. Charles V. Chapin will be recommended to every one who is interested in public health. Dr. Chapin, for many years health officer of Providence, R. I., has contributed some of the most important thoughts to modern public health. It was he who made the first comprehensive survey of public health activities of state government under the direction of the Council on Health and Public Instruction of the American Medical Association in 1915. On this preliminary work has been built much of the modern movement for appraisal of public health work. It was Dr. Chapin who early pointed out wasteful public health activities as opposed to effective lines of public health work. It was Dr. Chapin who pointed the finger of scorn at the "fetish of disinfection" and distinguished between justifiable measures and unjustifiable measures for the spread of infectious diseases. It was under his direction that the city of Providence not only maintained but utilized with telling effect the longest continuous record of vital statistics available from any American city. The collection published under this title is a representative selection. The book is illustrated with a picture of Dr. Chapin. It should have a place in the library of every public health worker. Physicians will find it intensely interesting and stimulating, especially in view of the growing interest of the profession in preventive medicine. The book contains among other features a complete bibliography of Dr. Chapin's most important contributions along the line of public health.

Modern Treatment in General Practice. Edited by Cecil P. G. Wakeley, D.Sc., F.R.C.S., F.R.S.E. Cloth. Price, $4. Pp. 426, with illustrations. Baltimore: William Wood & Company, 1934.

These articles were written by specialists for the general practitioner. They were first published in the *Medical Press and Circular*, some as individual articles and others as symposiums. The authors of these articles generally are well known members of the profession in England. There was no attempt apparently to cover the entire field of medicine, and the subjects discussed, aside from those in the symposium, do not have any direct relation to one another. Some of the subjects discussed are acute circulatory failure, diabetic coma, blood transfusion, migraine, insomnia, chronic hoarseness, anemias and pyorrhea. One of the articles on the spa facilities in England opens with the statement that "if the value of spa treatment in the cure or prevention of disease were sufficiently well known, many sudden deaths and many years of suffering and crippledom might be prevented, and many useful lives prolonged in happy content, and our spas would be overcrowded."

If such is the case, it would seem to be the duty of those who are expert and widely experienced in spa treatment to present evidence that will convince the profession quite generally of the accuracy of the foregoing statement.

Epidemic Myalgia: Bornholm Disease. By Ejnar Sylvest, M.D. With a foreword by Dr. Th. Madsen, Director of the Danish State Serum Institut, Copenhagen. Translated from Danish by Hans Andersen, M.D. Paper. Price, 8 Danish crowns; 7/6. Pp. 155. Copenhagen: Levin & Munksgaard; London: Humphrey Milford, Oxford University Press, 1934.

The original Danish edition of this monograph was discussed in the editorial columns of THE JOURNAL, February 10, under the title of epidemic myalgia, or pleurodynia. The editorial summary gives references to the reports of the outbreaks of the disease in the United States. Probably the disease is more frequent than is now realized. The translation into English of Sylvest's excellent monograph will be of great help in spreading the knowledge of epidemic myalgia, also called in Danish literature Bornholm disease on account of the great many cases occurring in the Danish island Bornholm, where Sylvest, a practicing physician, made his valuable observations. Bornholm is not the place, however, where the disease was recognized first.

Acute Intestinal Obstruction. By Monroe A. McIver, M.D., Surgeon-in-Chief, Mary Imogene Bassett Hospital, Cooperstown, N. Y. Cloth. Price, $7.50. Pp. 430, with 62 illustrations. New York: Paul B. Hoeber, Inc., 1934.

This book thoroughly covers all phases of acute intestinal obstruction. The author has concentrated particularly on its clinical aspects. Approximately a sixth of the book is given over to a discussion and evaluation of experimental methods used in the study of intestinal obstruction. References made to important contributions in other studies of the disease and an adequate bibliography are presented at the end of each chapter. The book is well illustrated by reproductions from the original articles, to which frequent reference is made. Most of the illustrated cases used by the author were taken from the records of the Massachusetts General Hospital. The book is readable, and the author's knowledge of the disease, as evidenced by numerous contributions to the literature on intestinal obstruction before the publication of the book, makes it of exceptional value.

Medicolegal

Malpractice: Limitation of Actions; Concealment of Right of Action.—In June 1929 the defendant-dentist extracted ten of the plaintiff's teeth and prepared a denture. About three months later the defendant, attributing the pain of which the plaintiff complained to the fit of the denture, filed a small portion of it, administered a drug to alleviate the pain, and replaced the denture. On three other occasions, at intervals of about three months, the plaintiff returned to the defendant with the same complaint and the defendant each time followed the procedure just noted. Finally, at the suggestion of the defendant, the plaintiff, in August 1930, consulted another dentist, who discovered that three broken roots were embedded in the plaintiff's jaw bone and removed them. The pain disappeared. In May 1931 the plaintiff sued the defendant-dentist for malpractice and obtained judgment. The dentist then appealed to the court of appeals of Louisiana, Orleans.

The defendant contended that the Louisiana statute which requires tort actions to be instituted within one year from the accrual of the cause of action barred the plaintiff's suit. The statute referred to by the defendant [Civil Code, art. 3537], said the court, normally runs from the day on which the damage was sustained. An exception is recognized, however, in cases in which the plaintiff, through some act of the defendant, is kept in ignorance of the fact that damage has been done. The evidence here shows that for about fourteen months immediately following the extractions the defendant attempted to alleviate the pain from which the plaintiff was suffering. During this time the plaintiff did not know that roots were still embedded in his jaw bone and that they were the cause of the pain. Under such circumstances the statute did not commence to run until the plaintiff discovered the cause of his injury. So long as the plaintiff continued to rely on the professional advice of the defendant and so long as the defendant continued to assure the plaintiff that the pain was being caused by the denture, there was no obligation on the part of the plaintiff to seek redress in the courts. It would be inequitable to permit a physician or dentist, who discovers that he has negligently injured his patient and continues to treat the patient, concealing the true condition until the action is barred, to plead then that the action is brought too late. It is immaterial whether the physician or dentist discovers the mistake and intentionally conceals it or negligently fails to discover it. The important factor is that through reliance on the physician's or dentist's care the patient has not discovered that the injury which he has sustained resulted from the fault of the physician or dentist.

The court of appeals could find no error and the judgment in favor of the plaintiff was accordingly affirmed.—*Perrin v. Rodriquez (La.), 153 So. 555.*

Compensation of Physicians: Liability of Patient for Consultant's Fee; Creation of an Account Stated.—On the advice of his family physician, the defendant engaged Dr. H. G. Tobey to treat his son, who was suffering from mastoiditis. Dr. Tobey decided that an operation was necessary and suggested to the family physician that Dr. G. L. Tobey Jr. be engaged to operate. At the request of the family physician, Dr. G. L. Tobey Jr. did operate. On the failure of the defendant to pay for the services rendered, Drs. H. G. and G. L. Tobey Jr. brought suit for their fees. The defendant claimed that he neither engaged Dr. G. L. Tobey Jr. to render any medical or surgical services nor consented to his operating. He asserted that he engaged Dr. H. G. Tobey.

It is inconceivable, said the supreme court, Columbia county, New York, that the defendant did not know what physician was to operate on his son or that he had no knowledge as to who was treating and caring for his son during convalescence. Ordinary paternal interest, observed the court, would have compelled a father to ascertain these facts. Even had the services been performed without the consent or knowledge of the father, he would still be liable. In so holding, the court quoted as follows from *In Matter of Sherman's Estate*, 6 Pa. Co. Ct. Rep. 225, in which a patient was attended by a physician who subsequently, and without the patient's consent or knowledge, called another physician in consultation:

> If the right in the consulting physician to compensation for this service is without legal merit, then the law is a reproach to conscience. That it [this question] has not been passed upon hitherto, means nothing; or rather, it means that it has never been questioned, any more than the right of the physician to charge his patient with the drugs he has purchased, or the nurse he has hired for him, when drugs and nursing were indispensable to his recovery.

As to the value of the plaintiffs' services, the court thought there had been an account stated. The defendant had admitted, in letters to "Dr. Tobey," that he had received a bill from a collection agency and that the sum stated therein was justly due and owing. He had made a payment on account with a promise to pay the bill in full. Where an account is rendered, said the court, the person receiving it is bound to examine it, and, if he admits it to be correct, it becomes an account stated and binding on both parties. It is conclusive unless fraud and mistake or other equitable considerations are shown which make its enforcement improper.

The court accordingly entered a judgment in favor of the plaintiff physicians.—*Tobey v. Nelson (N. Y.), 270 N. Y. S. 201.*

Society Proceedings

COMING MEETINGS

American Academy of Orthopedic Surgeons, New York, Jan. 14-16. Dr. Philip Lewin, 104 South Michigan Boulevard, Chicago, Secretary.

Puerto Rico, Medical Association of, Santurce, Dec. 14-16. Dr. Julio R. Rolenson, Box 3403, Santurce, Secretary.

Radiological Society of North America, Memphis, Tenn., December 3-7. Dr. Donald S. Childs, 607 Medical Arts Building, Syracuse, N. Y., Secretary.

Southern Surgical Association, Sea Island, Ga., Dec. 11-13. Dr. Robert L. Payne, 142 York Street, Norfolk, Va., Secretary.

Western Surgical Association, St. Louis, December 7-8. Dr. Albert H. Montgomery, 122 South Michigan Boulevard, Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Obstetrics and Gynecology, St. Louis

28: 473-628 (Oct.) 1934

Endometrial Findings in Functional Menstrual Disorders. B. M. Anspach and J. Hoffman, Philadelphia.—p. 473.

Further Studies on Pelvic Architecture. W. E. Caldwell, H. C. Moloy and D. A. D'Esopo, New York.—p. 482.

*New Measurement (Clinical) for Estimating Depth of True Pelvis: Preliminary Communication. W. Schuman, Baltimore.—p. 497.

*Survey of One Thousand Gonococcus Complement Fixation Tests Performed with Serum of Female Patients in an Outpatient Clinic. W. M. Brunet and B. S. Levine, Chicago.—p. 501.

Treatment of Trichomonas Vaginalis Vaginitis with Sodium Perborate and Quinine. I. W. Kahn, New York.—p. 511.

Treatment of Diseases of Cervix by Electrosurgical Unit, with Especial Reference to Cervicitis. M. L. Stadiem, New Orleans.—p. 514.

Cancer and Prolapse of Uterus. F. V. Emmert and J. B. Taussig, St. Louis.—p. 521.

Kidney Function in Pregnancy: III. Water Diuresis in Toxemias of Pregnancy. Mary A. McManus, Gertrude A. Riley and J. C. Janney, Boston.—p. 524.

*Sedimentation Rate and Schilling Index in Pregnancy. R. J. Griffin, Philadelphia.—p. 532.

Macrocytic Hyperchromic Anemia in Pregnancy: Report of Case and Review of Literature. W. E. Studdiford, New York.—p. 539.

Relation of Anemia of Pregnancy to Hydremia and Its Treatment with Aqueous Equine Liver Extract and Glycerated Iron. O. Richter, A. E. Meyer and J. P. Bennett, Chicago.—p. 543.

Study of Seventy-Nine Patients Delivered by Latzko Extraperitoneal Cesarean Section. H. T. Burns, New York.—p. 552.

Analysis of One Hundred and Fifty-Seven Cases of Cesarean Section. G. A. Palmer, Akron, Ohio.—p. 557.

Pregnancy Complicated by Fibroids. J. R. Eisaman, Pittsburgh.—p. 561.

Accidental Injection of Iodized Oil into Uterine Veins. S. R. Meaker, Boston.—p. 568.

Embedding of Ovum in Tubal Pregnancy: Review. H. C. Falk, New York.—p. 572.

Effect of Shape of Pregnant Uterus on Mechanism of Labor. J. M. Laferty, Philadelphia.—p. 582.

Another Method of Anesthesia in Obstetrics. C. W. Schumacher, St. Louis.—p. 587.

Bleeding Time and Coagulation Time in the New-Born. M. Weiner and C. E. Bailey, Denver.—p. 593.

Granulosa Cell Tumor of Ovary in Child with Precocity. P. B. Bland and L. Goldstein, Philadelphia.—p. 596.

Krukenberg Tumor of Ovaries. A. Saccone and Sarah Gordon, New York.—p. 601.

Enormous Ovarian Cyst. W. F. Gemmill, York, Pa.—p. 603.

Practical Obstetric Manikin. J. B. Jacobs, Washington, D. C.—p. 605.

Combined Inlet and Outlet Pelvimeter. S. Hanson, Stockton, Calif.—p. 608.

Postpartum Paralysis: Report of Unusual Case. A. Cline, Dayton, Ohio.—p. 611.

Bicornate Uterus with Pregnancy in Each Horn. A. B. Barrett, Nashville, Tenn.—p. 612.

Simultaneous Gangrenous Twisted Ovarian Cyst and Acute Gangrenous Appendicitis. L. P. Kasman, Brooklyn.—p. 614.

Measurement of Depth of True Pelvis.—Schuman calls attention to the use of a new external measurement, based on the suggestions of Caldwell and Moloy, and intended to estimate the depth of the true pelvis. The perpendicular distance from the tuberosity of the ischium to the iliopectineal line is measured easily by using the ordinary pelvimeter. It should be taken immediately after the intertuberous diameter has been measured, and, with one end of the pelvimeter still on the tuberosity, the other end is swung round until at a point on the upper border of the superior ramus of the pubis directly perpendicular to the tuberosity. The author has found that this distance averages 11.5 cm. Allowance must be made for pubic and gluteal fat; in the patient of normal build, 1 cm. should be allowed for soft parts, and in obese patients, 2 cm. He calls this diameter the "right or left pubotuberous."

Gonococcus Complement Fixation Tests.—Brunet and Levine performed routine gonococcus complement fixation tests with the blood serum of 1,000 female patients in order to establish with the aid of clinical study the practical value of this laboratory procedure. They conclude that in routine clinical work gonococcus complement fixation results should be considered specific only after certain factors have been taken into consideration. In the early stages of a suspected new infection, the persistence of a positive reaction, regardless of its intensity, is of importance and points to the specificity of the reaction. The fact that a large proportion of the cases known to have gonococcic activity give negative results is due entirely to the use of a strongly lytic complement unit, which renders negative otherwise weakly positive results. The method by which gonococcus antigen is at present prepared generally makes the use of a high complement unit imperative. Positive complement fixation results are obtained rarely in the instance of old cured patients, for the gonococcus antibody persists only from one to six weeks following the disappearance of the organisms. Therefore in the absence of a seropositive syphilis, a persistently positive gonococcus complement fixation test establishes active gonorrhea. If a new infection is excluded definitely, the existence of a chronic activity is diagnosed. Complicated cases of gonococcic infection in the female do not react any more strongly than do simple infections, except so far as they are, as a rule, of longer standing. The time factor influences the reaction. In cases of salpingitis, especially of the chronic type, complement fixation offers possibly a means for the differentiation of gonococcic from nongonococcic salpingitis. To lessen the frequency of the occurrence of nonspecific results, and possibly to eliminate them, a complement dose of high lytic potency should be used, as was suggested by Kolmer. With such a procedure of gonococcus complement fixation many of the early and weak reactions are rendered negative, but the procedure as a whole is placed on a safe level of reactivity.

Sedimentation Rate in Pregnancy.—Griffin states that the sedimentation rate of the erythrocytes increases progressively with each month of normal pregnancy. The rate in the ninth month is approximately five times that given for the average normal nonpregnant woman. There is a return practically to normal by the fourth week after delivery. A group of patients with toxic symptoms showed more rapid sedimentation rates than the average for normal pregnant women in the same month of gestation. The average readings were from 10 to 15 points higher by the percentage method of recording. There is a mild regenerative type of activity of the bone marrow during pregnancy, as shown by the Schilling index.

American Journal of Physiology, Baltimore

109: 593-738 (Oct. 1) 1934

Reflex Activity Within Sympathetic Nervous System. H. G. Schwartz, Boston.—p. 593.

Differentiation Between Photosensitized and Ultraviolet Effects on Frogs. H. F. Blum and C. R. Spealman, Berkeley, Calif.—p. 605.

Passage of Fluid and Certain Dissolved Substances Through Intestinal Mucosa as Influenced by Changes in Hydrostatic Pressure. E. S. Nasset and A. A. Parry, Rochester, N. Y.—p. 614.

Respiratory Adaptation to Anoxemia. A. Hurtado, N. Kaltreider and W. S. McCann, Rochester, N. Y.—p. 626.

Effect of Hydrogen Ion Concentration on Absorption of Sugars. E. Gellhorn and L. F. Moldavsky, Chicago.—p. 638.

Effect of Fluorine on Calcium and Phosphorus Metabolism in Albino Rats. Edith M. Lantz and Margaret Cammack Smith, Tucson, Ariz.—p. 645.

Interactions of Gonad Stimulating Hormones in Ovarian Development. H. L. Fevold and F. L. Hisaw, Madison, Wis.—p. 655.

Cardiac Output in Man: Adaptation of Katharometer for Rapid Determination of Ethyl Iodide in Estimations of Cardiac Output by Ethyl Iodide Method: Study of Effect of Posture on Cardiac Output and Other Circulatory and Respiratory Measurements. J. S. Donal Jr., C. J. Gamble and R. Shaw, Philadelphia.—p. 666.

Measurement of Oxygen Consumption of Immature Rats. J. E. Davis and A. B. Hastings, Chicago.—p. 683.

Continuous Measurement of Velocity of Venous Blood Flow in Arm During Exercise and Change of Posture. S. H. Proger and L. Dexter, Boston.—p. 688.

Interaction of Cortical and Labyrinthine Impulses to Ocular Muscle Movements. E. A. Spiegel and L. Aronson, Philadelphia.—p. 693.

Persistence of Cochlear Electrical Disturbance on Auditory Stimulation in Presence of Cochlear Ganglion Degeneration. J. Guttman and S. E. Barrera, New York.—p. 704.

Respiratory Effect of Prolonged Anoxemia in Normal Dogs Before and After Denervation of Carotid Sinuses. C. L. Gemmill, E. M. K. Geiling and D. L. Reeves, Baltimore.—p. 709.

American Journal of Tropical Medicine, Baltimore

14: 363-496 (Sept.) 1934

Length of Life and Rate of Loss of Hookworms, Ancylostoma Duodenale and Necator Americanus. J. F. Kendrick, New York.—p. 363.
Third Year's Observation in Panama, with Especial Reference to Control with Atabrine. W. H. W. Komp and H. C. Clark, Panama, Republic of Panama.—p. 381.
Flight Range of Anopheles in the Philippines: Second Experiment with Stained Mosquitoes. P. F. Russell, New York, and D. Santiago, Manila, P. I.—p. 407.
Feeding Habits of Some Venezuelan Anopheles. Rolla B. Hill, Paris, France.—p. 425.
*Susceptibility of Red Cells to Malaria: Preliminary Note. P. Eaton, Jacksonville, Fla.—p. 431.
Retention of Endamoeba Histolytica Cysts Under Fingernails. J. Andrews, Baltimore.—p. 439.
Further Studies on Effect of Amebicidal Drugs on Tissue Culture Cells (Arsenious Trithio Salicylic Acid, Carbarsone, Kurchi, Bismuth Iodide, Proparsamide, Vioform). M. J. Hogue, Philadelphia.—p. 443.
Some Observations on Effects of Tropical Climate Under Experimental Conditions. E. B. McKinley, Washington, D. C., and Trinita Rivera, San Juan, Puerto Rico.—p. 457.
Anthelmintic Properties of Certain Alkyl Phenols. P. D. Lamson, H. W. Brown and P. D. Harwood, Nashville, Tenn.—p. 467.
Relapsing Fever in Texas: IV. Ornithodorus Turicata Duges: Vector of Disease. H. A. Kemp, W. H. Moursund and H. E. Wright, Dallas, Texas.—p. 479.
Improved Technic for Mounting Mosquito Larvae. J. F. Buckner, Panama, Republic of Panama.—p. 489.

Susceptibility of Red Cells to Malaria.—Eaton proposes the following hypothesis: The red cell is susceptible to infection with malaria only when it is in the reticulocyte stage. Schizonts that do not infect promptly are phagocyted. Anything that increases the actual number of reticulocytes favors the progress of the disease. The rate of production of schizonts follows a fairly regular curve, which can be worked out easily. The rate of production of red cells follows a curve that is not worked out so easily. If a crest in the schizont curve meets a crest in the red cell curve, the conditions for extension of the disease are present. If on the other hand a crest in the schizont curve meets a trough in the red cell curve, the conditions for regression or even spontaneous cure of the disease are present. The conditions are subject to such enormous variation that they probably would defy mathematical analysis.

Archives of Internal Medicine, Chicago

54: 483-658 (Oct.) 1934

Acute Diffuse Glomerular Nephritis: Study of Ninety-Four Cases, with Especial Consideration of Stage of Transition into Chronic Form. F. D. Murphy, J. Grill and Gail F. Moxon, Milwaukee.—p. 483.
*Effect of Cardiac Infarction on Tolerance of Dogs to Digitalis: Experimental Study. S. Bellet, C. G. Johnston and A. Schecter, Philadelphia.—p. 509.
Relationship Between Oxygen Consumption and Nitrogen Metabolism: IV. Experiments on Animals. C. W. Baldridge, Iowa City.—p. 517.
Hepatic Function: I. Noncalculous and Calculous Cholecystitis. A. Cantarow, Philadelphia.—p. 540.
*Putrid Empyema, with Especial Reference to Anaerobic Streptococci. A. M. Fisher, Baltimore, and T. J. Abernethy, New York.—p. 552.
Unilateral and Bilateral Resection of Major and Minor Splanchnic Nerves: Its Effects in Cases of Essential Hypertension. W. M. Craig and G. E. Brown, Rochester, Minn.—p. 577.
Allergic Death: VII. Protracted Shock. G. L. Waldbott, Detroit.—p. 597.
*Lymphedema of Extremities: Classification, Etiology and Differential Diagnosis: Study of Three Hundred Cases. E. V. Allen, Rochester, Minn.—p. 606.
*Carcinomatous Endarteritis of Pulmonary Vessels Resulting in Failure of Right Ventricle. E. B. Greenspan, New York.—p. 625.
Acute Essential Hypertension Precipitated by Mediastinal Abscess. C. A. McKinlay, T. J. Kinsella and R. B. Radl, Minneapolis.—p. 645.

Cardiac Infarction and Tolerance of Dogs to Digitalis.—Bellet and his associates determined the tolerance of dogs to digitalis at various intervals after ligation of the coronary artery: half an hour after ligation of the coronary artery, four days later (during the stage of acute and subacute infarction) and from six weeks to six months later (during the stage of chronic infarction). The tolerance of these animals was compared with that of animals in a normal control series. Dogs standardized within half an hour after ligation showed no diminution in tolerance to digitalis as compared with those in a control group. During the stage from acute to subacute infarction there was a diminished tolerance to digitalis, which averaged from about 20 to 30 per cent below the average of the figures for the normal controls. In the animals with chronic infarction, in which the area of infarction was considerably smaller than in the acute or subacute stage (standardized from six weeks to six months after ligation of the coronary artery), the tolerance was less than that of the normal animals but higher than that of the group with the subacute infarctions. The diminution in tolerance after ligation of the coronary artery depends apparently on the presence of infarction and probably also on the extent and stage of the infarcted area. The observations lend support to the clinical impression that digitalis in massive doses may be dangerous during the stage of subacute and chronic infarction and that it should be used with caution in such cases.

Empyema and Anaerobic Streptococci.—Fisher and Abernethy report seven cases of severe purulent infections, four of which presented putrid empyema, two pulmonary abscess and one multiple hepatic abscesses. In the four cases the empyema developed suddenly and was not a complication of a preceding chronic pulmonary infection. The studies indicated that the pleural infection was associated with intrapulmonary infection. This relationship was proved at necropsy in two of the cases. Anaerobic streptococci were present in each case, although the associated organism, which constituted the flora, was not consistently of one type. That the method of laboratory cultivation is of special importance is demonstrated by the fact that streptococci were recovered chiefly under anaerobic conditions, when the usual aerobic methods failed. Of the four strains of streptococci, two were viridans, one nonhemolytic and one hemolytic. In biologic and cultural characteristics they resemble in some ways the Streptococcus putridus of Schottmüller and the Streptococcus intermedius of Prévot. The latter organism was found in pulmonary conditions, but both these types are described as strict anaerobes, whereas those in the authors' cases were facultative anaerobes. Their studies indicate that the anaerobic streptococcus was the chief etiologic agent in the four cases of putrid empyema, in one of which it invaded the blood stream, produced multiple metastatic abscesses and endocarditis and was obviously the cause of death. Surgical drainage seems to offer the best chance of cure. Intravenous injections of neoarsphenamine are probably of value in cases in which spirochetes are found, especially if they are in the sputum also. Extensive cellulitis of the thoracic wall, with the formation of gas, may follow surgical drainage or aspiration, owing to the leakage of the organisms along the path of the needle or the incision. A therapeutic procedure that may offer additional help in dealing with such effusions is the replacement of the empyema by air. Anaerobic streptococci were found to be the predominant organisms in the two cases of pulmonary abscess in which cultures were made directly from the pus at operation. In the case of pyelophlebitis with multiple hepatic abscesses due to an anaerobic streptococcus an attempt was made to identify the streptococci with the various types reported in the literature. They do not fulfil completely the characteristics of any one group. Cultures of one strain were capable of producing empyema in rabbits when injected intrapleurally. Other strains gave varying results under similar conditions. Evidence is presented to indicate that these streptococci may often be pathogenic for man and for animals.

Lymphedema of Extremities.—Allen believes that the confusion regarding lymphedema is due to its relative rarity, to an inadequate knowledge of its etiology, bacteriology and pathology, and to the absence of a comprehensive classification. He feels that the pertinent data from the records of 300 cases observed at the Mayo Clinic offer an opportunity to fill many of the gaps. He reviews the important facts regarding lymph vessels and lymph, presents a classification of lymphedema, gives descriptions of the various types of lymphedema, discusses the mechanism of production, and considers the differential diagnosis of lymphatic edema and other types of edema. He points out some of the gaps in the knowledge of lymphedema in order to stress the need for further investigation and in order to explain why it is impossible to present a completed picture of the disease. He feels that the shortcomings noted should encourage rather than discourage the investigator of lymphedema; the problems that remain unanswered are so important that any progress will be worthy of note.

Carcinomatous Endarteritis of Pulmonary Vessels Resulting in Failure of Right Ventricle.—Greenspan presents four cases of carcinomatous lymphangitis. Three were secondary to scirrhous adenocarcinoma of the stomach and one

to adenocarcinoma of the sigmoid. In all four, the physical signs of the pulmonary involvement were inconspicuous and yet the clinical picture was characterized by an initial cough and by rapidly increasing dyspnea and deepening cyanosis. Two of the patients died with evidences of rapidly progressive failure of the right side of the heart. The roentgen diagnosis of carcinomatous lymphangitis of the lungs was confirmed by necropsy in two cases. In the three cases of scirrhous adenocarcinoma of the stomach, necropsy revealed a widespread obliterative endarteritis of the smaller pulmonary vessels. In two of these cases the vascular changes were sufficiently extensive to explain the failure of the right side of the heart. This obliterative endarteritis is due mainly to the influence of the plugging of the neighboring perivascular lymphatic channels by carcinoma, so-called carcinomatous lymphangitis. The vascular occlusions result to a minor degree from carcinoma cell emboli that have entered the pulmonary circulation by way of the thoracic duct and the superior vena cava. A few carcinoma cell emboli were found that had accumulated blood platelet thrombi in their passage through the blood stream and subsequently had undergone rapid organization after they had come to lodge in small branches of the pulmonary arteries. In cases of right ventricular cardiac failure presenting no significant pulmonary or cardiac involvement, the possibility of a diffuse secondary carcinomatous lymphangitis of the lungs with accompanying obliterative endarteritis of the pulmonary vessels should be considered.

Archives of Neurology and Psychiatry, Chicago

32: 681-914 (Oct.) 1934

Postoperative States of Excitement. W. Muncie, Baltimore.—p. 681.
*Heat Production and Heat Control in Schizophrenic Reaction. D. E. Cameron, Brandon, Manit.—p. 704.
Cardiovascular System in Schizophrenia Studied by the Schneider Method. J. M. Linton, M. H. Hamelink and R. G. Hoskins, Worcester, Mass.—p. 712.
Mental State of the Epileptic Patient. E. M. Bridge, Baltimore.—p. 723.
*Facial and Meningeal Angiomatosis Associated with Calcifications of Brain Cortex: Clinical and Anatomopathologic Contribution. K. H. Krabbe, Copenhagen, Denmark.—p. 737.
*Changes in Cutaneous Localization in Pedicle Flap. Beverly Douglas and L. H. Lanier, Nashville, Tenn.—p. 756.
Histopathology of External Geniculate Body. A. T. Steegmann, Cleveland.—p. 763.
Experimental Lesions of Pyramidal Tract. C. Marshall, New Haven, Conn.—p. 778.

Heat in Schizophrenic Reaction.—Cameron bases the following observations on approximately 10,000 temperature readings in fifty schizophrenic and fifty control subjects: 1. The internal temperature in the schizophrenic group was throughout the day slightly lower than that in the nonschizophrenic psychotic group, both groups being at room temperature. 2. There is evidence to show that at room temperature the mechanism of heat control in the schizophrenic group is more active than in the nonschizophrenic group. 3. Observations on exposure to extreme cold suggest that the mechanism of heat control acts more sharply and more strongly in the schizophrenic than in the nonschizophrenic group. 4. Exposure to extreme heat reveals no weakness in the mechanism of heat control in the schizophrenic group. 5. The response to the ingestion of food is more marked but less well sustained in the schizophrenic than in the nonschizophrenic group. 6. These observations are not consistently true for the individual subject, but only for the group. It is doubtful whether it would be wise to accept the suggestion afforded by any one of the experiments alone, but the fact that all tend to reveal the same condition, together with the large number of observations, makes the author feel justified in according a fair degree of probability to the contentions that (1) heat production in the schizophrenic is lower than in the nonschizophrenic group and (2) heat control in the schizophrenic group is more active than in the nonschizophrenic group, this being apparently in the nature of a compensation for the decreased output of heat.

Facial and Meningeal Angiomatosis Associated with Calcifications of Brain Cortex.—Krabbe reports six cases that present a characteristic clinical picture, nearly all showing a combination of epileptic fits and angiomas of the face. To these, the most prominent symptoms, may be added, as frequent symptoms, mental debility and a slight spastic hemiplegia on the side opposite to the angioma of the face. Furthermore, the patients are sometimes rather fat. If roentgen examination is made, a characteristic shadow appears inside the skull: a distinct sinuous shadow, presenting exactly the shape of the surface of the brain, showing both gyri and sulci, often with double contours. Generally, this shadow is localized in the occipital lobe. Histologic examination of the brain shows that the shadow is due to calcification of the outer layers of the cortex, not of the pia mater. This presents in some parts an abundant vascularization but not a true angioma. The calcification consists of numerous small, mostly microscopic, granules of lime salts, localized in the second and third layers of the cortex. In these layers the nerve tissue is in great part destroyed and replaced by fibrillar neuroglia. In the case described the occipital lobe, in which the processes were localized, had shrunk and was sclerotic. Otherwise the brain seemed fairly normal; only in places were the same modifications seen to a slight degree. The changes in the brain probably are not secondary to angiomas of the pia mater. The syndrome must be related to a more generalized malformation of the organism (as in tuberous sclerosis), consisting in the formation of angiomas of the face, slight angiomatous modifications of the pia mater, aplasia of the occipital lobe of the brain with (probably secondary) sclerosis and calcification of the aplastic part. The malformations probably originate in fetal life. The calcifications are related not to a tumor but to a congenital defect and malformation. Hence, operation is not indicated. Roentgen treatment may perhaps be administered to please the patient. No striking results are to be expected from treatment, however, since regeneration of aplastic brain tissue is not possible. Symptomatic treatment for the epileptic fits and mental hygienic treatment for the mental defects must be considered as the only therapy.

Cutaneous Localization in Pedicle Flap.—Douglas and Lanier cite a case in which a pedicle flap from the right nasolabial region was substituted for the right four fifths of the lower lip. The dissection of the flap resulted in denervation of the outer fourth (roughly) of its free end, but the original nerve supply entering from the pedicle was left intact and sensations from this sensitive portion were referred mainly to the upper lip and cheek. Results of localization tests carried out on the sensitive part of the flap revealed a progressive shift of "local sign" from the upper lip and cheek to the lower lip. The development of reorientation required several months. A transitional stage was observed, involving considerable confusion and a tendency to localize sensations in an area intermediate between the old and the new locations of the flap. This tendency was interpreted as a resolution of the conflict arising between the old and the new orientation habits. No reference was observed on return of sensitivity to the denervated portion of the pedicled flap. The ability to localize sensations within this area began to return within six weeks and was apparently coincident with the ingress of nerve fibers from the edges of the chin and lip to which the flap was attached. The results indicate that "local sign" depends mainly on habit formation, involving the association of cutaneous impulses with the kinesthetic impulses.

California and Western Medicine, San Francisco

41: 217-288 (Oct.) 1934

Chronic Arthritis: Its Treatment. R. L. Cecil, New York.—p. 217.
Acute Intestinal Obstruction. L. Brooks, San Francisco.—p. 219.
Burns: Their Treatment. D. Weaver, Oakland.—p. 222.
Hypertension: Rôle of Infections Therein: Part II. J. T. King, Jr., Baltimore.—p. 226.
Roentgenotherapy of Superficial Malignancies. H. J. Ullmann, Santa Barbara.—p. 230.
Undulant Fever. J. C. Ruddock, Los Angeles.—p. 233.
Chronic Cicatrizing Enteritis. H. G. Bell, San Francisco.—p. 239.
Induction of Labor: Using Quinine, Castor Oil, Rupture of Membranes and Nasal Pituitrin. O. M. Holmes, San Mateo.—p. 241.
Lobar Pneumonia: Attempt to Evaluate Various Methods of Treatment. W. E. R. Schottstaedt, Fresno.—p. 244.
Some Contributions by Animals to Human Health. A. C. Ivy, Chicago.—p. 247.
Specific Gravity in Spinal Anesthesia. E. M. Bingham, Riverside.—p. 251.
Problems of Obesity. A. E. Koehler, Santa Barbara.—p. 253.
Craniocerebral Injuries: Their Management. C. W. Rand, Los Angeles.—p. 257.
Compulsory Health Insurance: Part VII. F. L. Hoffman, Philadelphia.—p. 262.

Illinois Medical Journal, Chicago

66: 301-400 (Oct.) 1934

Ten Years of Progress in Treatment of Fractures. F. J. Cotton, Boston.—p. 317.
Fractures of Elbow. S. H. Easton, Peoria.—p. 324.
Obstetrics Is a Surgical Specialty: Four Illustrative Case Reports. J. J. Gill, Chicago.—p. 329.
*Treatment of Verrucae by Local Injections of Bismuth. H. Shellow, Chicago.—p. 332.
Gastro-Intestinal Obstruction Simulating Malignancy. F. Deneen, Bloomington.—p. 336.
Present Typhoid Fever Situation in Illinois B. K. Richardson, Springfield.—p. 340.
Means of Reducing Mortality in Appendicitis. H. P. Saunders and J. J. Moore, Chicago.—p. 346.
Psychiatry's Place in Medicine. S. N. Clark, Jacksonville.—p. 350.
The American Medical Association: Its Duty to Its Members and to the Nation's Veterans of the World War. F. S. Crockett, Lafayette, Ind.—p. 353.
What Is Right with the Medical Profession? Jean McArthur, Chicago.—p. 358.
Incipient Cataract. C. W. Geiger and J. H. Roth, Kankakee.—p. 362.
Common Cold in Infancy and Childhood. J. Brennemann, Chicago.—p. 366.
Aid of X-Ray in Diagnosis of Breast Tumors. I. H. Lockwood, Kansas City, Mo.—p. 371.
Rehabilitation of the Crippled Child from Standpoint of Orthopedic Surgery. F. A. Chandler, Chicago.—p. 375.
Radiotherapy and Electrosurgery in Treatment of Cancer of Breast. B. H. Orndoff, Chicago.—p. 377.
Pancreatic Dysfunction. B. Markowitz, Bloomington.—p. 380.
Value of Roentgenology in Urinary Disorders of Infancy and Childhood. J. R. Vonachen, Peoria.—p. 383.
Value of Symptoms. R. F. Herndon, Springfield.—p. 386.
Bone Metastases from Malignant Conditions of Prostate: Roentgen Study of Various Types. H. Olin, Chicago.—p. 388.

Treatment of Verrucae by Bismuth Sodium Tartrate.—Shellow employed an aqueous 15 per cent solution of bismuth sodium tartrate in the treatment of ninety-seven lesions of various types of verruca occurring in seventy-three patients. The skin about the lesion is prepared by washing with soap and water; then iodine and alcohol are applied. A fine hypodermic needle is used to pierce the skin just outside the zone of hyperkeratosis and directed downward and inward toward the base of the verruca at the most active point, the end of the needle remaining just above the corium. From a half to 2 minims (0.03 to 0.14 cc.) of the bismuth sodium tartrate solution is injected, according to the size of the lesion. In from one to three days after the injection a dark hemorrhagic area appears, visible through the keratotic surface. This denotes that the drug has taken effect. In the markedly keratotic hard type of ordinary verruca vulgaris this phenomenon may not always be seen. In most cases, from one to three days after the first injection there has been either a complete cessation or a marked diminution of pain. The peripheral redness that so often accompanies the painful verruca disappears in from two to seven days. All papillomatous lesions flatten out decidedly after the first injection, and in the plantar or palmar types the surface becomes smoother. If within seven to fourteen days following the appearance of the hemorrhagic center the top of the verruca has not come off or the central portion has not fallen out, the keratotic tissue may be removed to determine whether any activity is still present. In most instances, after a lapse of from fourteen to seventeen days following the initial injection the removal of this hemorrhagic keratotic center reveals an underlying normal appearing epidermis. If after two weeks of further observation an active verrucous tissue is seen, the lesion may be reinjected. Of the ninety-seven lesions, most of them having been treated previously by other measures, eighty-nine were cured, five improved and three showed no improvement. Sixty-seven lesions were of the painful palmar or plantar variety, and eighteen were of the verruca vulgaris type occurring on the dorsum of the hands or feet.

Indiana State Medical Assn. Journal, Indianapolis

27: 425-504 (Oct. 1) 1934

Granulocytopenia: Report of Two Cases. O. R. Spigler and J. F. Spigler, Terre Haute.—p. 425.
Salivary Calculus. S. Reisler, Indianapolis.—p. 429.
Hemorrhoidectomy Versus Office Treatments. E. L. Cartwright, Fort Wayne.—p. 431.
Definition, Description and Logic in Medicine. J. K. Berman, Indianapolis.—p. 434.
Bedside Observations on Prognosis. E. O. Asher, New Augusta.—p. 438.

Journal of Bone and Joint Surgery, Boston

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Endothelial Myeloma: Analysis of Cases. W. C. Campbell, Memphis, Tenn.—p. 761.
Coxa Plana and Related Conditions at the Hip. A. B. Ferguson and M. B. Howorth, New York.—p. 781.
Discoid External Semilunar Cartilage: Cause of Internal Derangement of Knee Joint. J. G. Finder, Iowa City.—p. 804.
Intrapelvic Protrusion of Acetabulum. C. Schaap, Arnhem, Holland.—p. 811.
Rôle of Bone Marrow and Endosteum in Bone Regeneration: Experimental Study of Bone Marrow and Endosteal Transplants. W. H. McGaw and M. Harbin, Cleveland.—p. 816.
Treatment of Fractures of Carpal Scaphoid. R. Soto-Hall and K. O. Haldeman, San Francisco.—p. 822.
Autogenous Bone Pegging for Epiphysitis of Tibial Tubercle. D. M. Bosworth, New York.—p. 829.
*Tuberculous Rheumatism: Résumé. E. A. Brav, Philadelphia, and P. S. Hench, Rochester, Minn.—p. 839.
Posterior Luxations of Lumbosacral Joint. R. W. Johnson Jr., Baltimore.—p. 867.
Posterior Displacement of Fifth Lumbar Vertebra. A. D. Smith, New York.—p. 877.
Thoughts on Relief of Sciatic Pain. C. H. Heyman, Cleveland.—p. 889.
*New Attempt at Treatment of Chronic Osteomyelitis. E. J. Bozsan, New York.—p. 895.
Congenital Dislocation of Hip Stretched by Means of Turnbuckle Cast. A. B. Gill, T. E. Orr and P. N. Jepson, Philadelphia.—p. 905.
Arthritis: Treatment with Sulphur by Intravenous and Intramuscular Injection. W. P. Argy, Washington, D. C.—p. 909.
Operative Correction of Extreme Flexion Contraction of Great Toe. L. C. Wagner, New York.—p. 914.
Large Bilocular Synovial Bursa in Plantaris of Man. B. M. Black, Stanford University, Calif.—p. 919.
*New Treatment for Delayed Union or Nonunion in Fractures. R. M. Carter, Green Bay, Wis.—p. 925.
Congenital Fusion of Spine. L. M. Overton and R. K. Ghormley, Rochester, Minn.—p. 929.
Correction of Knee-Flexion Deformity, After Poliomyelitis, by Wedging Plasters. R. E. Hughes and J. C. Risser, New York.—p. 935.
*New Operative Treatment for Fracture of Olecranon. C. Rombold, Wichita, Kan.—p. 947.
Surgical Approach to Obturator Foramen. S. Selig, New York.—p. 950.
Osteogenesis Imperfecta: Report of Two Cases. S. Kleinberg, New York.—p. 953.
Acute Osteomyelitis (Osteitis) of Patella: Case Report. J. Sagel, Gary, Ind.—p. 959.
Giant Cell Sarcoma of Patella: Case Report. M. O. Henry, Minneapolis.—p. 964.
Rupture of Biceps Tendon. G. I. Bauman, Cleveland.—p. 966.
Method of Maintaining Tension in Skeletal Traction Wires. E. N. Reed, Santa Monica, Calif.—p. 968.
Corrective Cast for Flexion Contracture Deformity of Knee. V. L. Hart, Minneapolis.—p. 970.
Improved Methods in Applying the Kirschner Pin by Hand or Electric Power. R. E. Niedringhaus, St. Louis.—p. 972.
Device to Aid in Maintaining Proper Alinement in Patients in Russell's or Buck's Extension. B. S. Epstein, Brooklyn.—p. 974.
Splints Combining Skeletal Traction and Countertraction. G. W. Hawley, Bridgeport, Conn.—p. 976.
Osteitis Deformans, "Paget's Disease," with Fracture of Femur and Prompt Union: Report of Case. F. G. Murphy, Chicago.—p. 981.
Attachment for Fracture Tables: Designed to Facilitate Application of Plaster Casts to Maintain Hyperextension of Spine. W. V. Newman, Little Rock, Ark.—p. 986.

Tuberculous Rheumatism.—Brav and Hench review the literature. As described by its proponents, this condition is a form of polyarthritis, simulating in some cases acute rheumatic fever or in other cases chronic atrophic arthritis but bearing some suggestion of tuberculous etiology. Familial tuberculosis, associated visceral tuberculosis, demonstration of Koch's bacilli in the synovial fluid and in the blood stream, positive results of inoculations of guinea-pigs with joint fluid and in some cases the presence of a typical tuberculous joint before, coincident with or subsequent to the development of polyarthritis have been considered evidence for the diagnosis of tuberculous rheumatism. The condition is thought to be due to a tuberculous toxin from some distant focus, a filtrable virus, an attenuated form of bacilli of tuberculosis or an allergic reaction. Formation of true tubercles, therefore, is not the expected finding and, when such pathologic change is present, a superimposed tuberculous arthritis, rather than the condition of tuberculous rheumatism, is thought to exist. Against the acceptance of the syndrome of tuberculous rheumatism have been arrayed a large number of competent investigators who have argued that there is no adequate clinical method of identifying it, no consistently characteristic roentgen evidence, no

experimental or laboratory evidence in its favor that is not highly controversial, and no consistent demonstration of any characteristic microscopic pathology. A statistical study of a series of 150 cases of acute rheumatic fever and 250 cases of chronic atrophic polyarthritis has revealed no significantly higher incidence of familial tuberculosis or associated visceral tuberculosis than that found in a group of 250 control cases. Of a series of seventy-five cases in which a diagnosis of chronic atrophic polyarthritis had been made and in which the pathologic characteristics of a single joint were determined by microscopic examination of tissue or inoculation of guinea-pigs, eight patients were found to be definitely tuberculous. In each of these the tuberculous identity of the joint was suspected prior to the examination of the tissue or inoculation of guinea-pigs, but the association with multiple arthritis was confusing.

Treatment of Chronic Osteomyelitis. — Bozsan believes that an area of aseptic bone necrosis anywhere in the skeletal system may be treated advantageously by connecting the necrotic segment with an adjacent living segment of bone by means of drill channels. He feels that the formulation of this working principle is fairly justified by the satisfactory results obtained after its application in cases of Legg-Calvé-Perthes disease, osteochondritis dissecans, Osgood-Schlatter disease, intracapsular fractures of the neck of the femur, and slipping and slipped upper femoral epiphyses; in all these conditions aseptic bone necrosis is the main pathologic feature. The spontaneous healing process of aseptic bone necrosis, brought about by any cause, is the substitution of living bone in the place of necrotic bone, effected by the slow penetration of tissue elements and capillaries of the adjacent living bone. The drilling of channels into the necrotic area presents nothing but the breaking of broad avenues to facilitate this invasion by new vessels. While attempting to compare the characteristic features of aseptic bone necrosis and necrosis in the wake of septic processes, such as suppurative osteomyelitis, the author has come to the conclusion that, in spite of the seemingly great discrepancies, in the last analysis no difference exists. The clinical and experimental observations of Bancroft on hematogenic osteomyelitis demonstrated that the substitution process is just as active in the recovery of these septic necroses as in the aseptic necroses. This circumstance, rather than the supposed attenuation of the infection, is the reason, in the author's opinion, for the good results obtained from the simple drill hole evacuation of chronic bone abscesses recommended by Brickner. Since the natural healing process in both aseptic and septic necrosis appeared to be analogous, it seemed possible that septic necrosis might respond favorably to the treatment that was found effective in aseptic necrosis. Therefore the author induced substitution and revitalization of necrotic areas of bone in chronic osteomyelitis by connecting these areas with living bone segments by means of saw cuts and drill channels. The procedure in the first two cases—observed one and three-fourths years and one year after operation, respectively—proved successful.

Operation for Delayed Union in Fractures. — Carter describes an operation for delayed union or nonunion in fractures which is based on the principle of drill holes proposed by Beck of Kiel. The procedure consists of boring a number of small holes through the fragment ends, across the line of fracture. This gives rise to a certain amount of hemorrhage, allows the penetration of new blood vessels and furnishes fresh bone pulp, thus creating a stimulus to new bone formation. The author has employed the method in five cases: one of fracture of the shaft of the femur, two of fracture of the tibia and two of fracture of the forearm. It is his opinion that, in those fracture cases with delayed union or nonunion for which no cause can be found which would indicate definitely some other form of treatment, the simplicity and harmlessness of this procedure warrant giving it a trial before resorting to open operation. When the drilling is properly done, the risk of infection is negligible and prolonged hospital confinement is unnecessary. If the treatment is successful, roentgenographic evidence of callus formation will be seen in from three to five weeks; if not, open operation can be performed then. The only contraindication to the performance of the drilling is an open, infected fracture.

Treatment for Fracture of Olecranon.—Rombold presents a technic for suture of a fracture of the olecranon. The skin incision extends from 2 inches distal to the olecranon to 5 inches proximally, and it is curved either laterally or medially to avoid the olecranon. The skin and subcutaneous tissue are reflected widely, exposing the ulna, the fracture, the olecranon and the triceps tendon. The old clot is cleaned from the fracture. The shaft of the ulna is drilled one-half inch distal to the fracture and well in front of the posterior cortex. Two strips of triceps tendon one-fourth inch wide and 3 inches long are used for the suture of the fracture. The proximal ends, the edges and the muscle-apposed surfaces are freed, and their insertions at the lateral and medial surfaces of the olecranon are left intact. The lateral strip is passed through the drill hole from the lateral to the medial surface and the medial strip is passed from the medial to the lateral surface. They are then tied to each other and sutured through the knot after the fractured fragments have been fixed snugly in position. The wound is closed in layers. The arm is carried in a sling for a week to ten days. Use up to the point of pain is encouraged after four or five days. Four patients have been operated on with perfect functional results.

Journal of Urology, Baltimore

32: 321-416 (Oct.) 1934

Some Dysfunctions Caused by Neoplasm, Especially of Adrenal Gland. W. C. Quinby, Boston.—p. 321.

Effects, on Upper Urinary Tract in Dogs, of an Incompetent Ureterovesical Valve. V. Vermooten and C. H. Neuswanger, New Haven, Conn.—p. 330.

Gonococcic Pyonephrosis: Report of Case with Review of Literature. C. A. W. Uhle, Philadelphia.—p. 335.

Cancer Mortality, Bladder, Kidney and Prostate 1917 to 1928. J. Duff, New York.—p. 346.

Distribution of Blood to Prostatic Urethra: Demonstration. H. C. Bumpus Jr., Pasadena, Calif., and W. Antopol, Bayonne, N. J.—p. 354.

Malignant Growths in Undescended Testicle: Review of Literature and Report of Two Cases. D. W. MacKenzie and M. Ratner, Montreal.—p. 359.

Calcified Hematocele of Tunica Vaginalis Testicle, with Spontaneous Rupture: Case Report, Discussion of Diagnosis and Etiology. H. M. Weyrauch Jr., Philadelphia.—p. 370.

*Some Unusual Cases of Filariasis of Scrotum and Groin. H. H. Young, Baltimore.—p. 383.

Filariasis of Scrotum and Groin. — Young reports five cases, four of which are quite similar and one an ordinary case of chronic epididymitis, which occurred following cystoscopy. This patient came from the same locality in Colombia, South America, but presented entirely different lesions. In the first three cases and the fifth the disease started as a peritesticular or periepididymal disease. It was characterized by the ultimate formation of a dense mass of tissue, which in two cases has enveloped completely and compressed the epididymis without involving the tissues of the epididymis. The disease has traveled upward outside the spermatic cord more or less loosely attached to the external fascia of the cord, in some instances forming large globular masses and in others very fine lines, suggesting lymphatic canals with small, bead-like enlargements along the course of the canal. The inguinal glands were enlarged. Ordinary bacterial inflammation, tuberculosis, syphilis or malignant disease has not been observed. The pathologic process is characterized particularly by the deposit or growth of large numbers of round cells, which have ultimately gone on to the formation of a marked fibrous sheath or covering. The tunica vaginalis in some instances has been involved extensively with adhesions to the testicle, but the testicle itself has been free from disease, although compressed and distorted by the fibrous tissue in one case. The intrascrotal cord produced by the disease has been characterized also by the presence of much vascularity, and round the walls of the blood vessels are numerous areas of round cell infiltration. There are spaces that may be lymph nodes, but they contain no material in the stained sections, and nothing suggesting either a large or a small worm or larvae, or detritus resulting from the presence of a dead worm, has been found. Nevertheless, it seems evident to the author that the disease is filarial in origin.

Minnesota Medicine, St. Paul

17: 563-616 (Oct.) 1934

Some Comments on Mortality and Morbidity Trends. H. W. Cook, Minneapolis.—p. 563.
The Rise of Clinical Thermometry in the United States. C. D. Freeman, St. Paul.—p. 572.
The Gangrenous Gallbladder. E. S. Judd and G. W. Waldron, Rochester.—p. 576.
Diet in Treatment of Gallbladder Disease. A. A. Wohlrabe, Minneapolis.—p. 578.
Primary Tuberculosis of Gallbladder. W. Walters and G. T. Church, Rochester.—p. 580.
Sinusitis and Asthma. C. E. Connor, St. Paul.—p. 582.
Carcinoma of Large Bowel. E. C. Bartels, Springfield, Ill.—p. 586.
Practical Experiments in What Actually Constitutes a Good Clinical Record. H. L. Dunn, Minneapolis.—p. 589.
Obstetric Analgesia. S. B. Solhaug, Minneapolis.—p. 595.

New Orleans Medical and Surgical Journal

87: 205-280 (Oct.) 1934

Pathology: Basis of Scientific Medicine. A. A. Herold, Shreveport, La.—p. 205.
*Paresis: Laboratory Findings, Treatment and Results. E. M. Robards and Hermine Tate, Jackson, La.—p. 209.
Ureteral Stricture: Diagnostic Problem. R. H. Brumfield, McComb, Miss.—p. 213.
Major Facts Concerning Appendicitis. D. C. McBride, Alexandria, La.—p. 215.
Compression Therapy in Treatment of Pulmonary Tuberculosis. Peachy R. Gilmer, Shreveport, La.—p. 220.
Hypotension in Relation to Toxemias in Pregnancy. G. A. Mayer, New Orleans.—p. 228.
Early Diagnosis of Diseases Involving Hip Joint. H. A. Durham, Shreveport, La.—p. 230.
The Handicapped Child. B. S. Waller, Silver Creek, Miss.—p. 235.
Importance of Epidemiologic Investigation. A. L. Gray, Jackson, Miss.—p. 239.

Dementia Paralytica.—Robards and Tate believe that all cases of constitutional syphilis that do not respond to treatment within six months should be regarded as potential dementia paralytica cases, and, as soon as any involvement of the nervous system is noted, the cerebrospinal fluid should be examined. The cerebrospinal fluid should be examined eighteen months after treatment, though it may be negative at that time. It should be examined again six months later. The fact that in dementia paralytica the globulin never disappears and the gold curve seldom regains a normal level indicates the necessity of periodic examinations of the spinal fluid. In syphilitic infected patients of the authors' hospital, dementia paralytica occurs most frequently in Negro men, white women, white men and Negro women in the order named, showing a pronounced increase in the Negro male. Tryparsamide with mercury and bismuth compounds is in all probability the most satisfactory form of therapy. Approximately twenty-five injections of tryparsamide produce clinical improvement. Serologically the effect on the cell count is rapid, frequently reaching normal after twenty injections. Induction of tertian malaria by direct injection of the blood from an infected person is probably the most satisfactory form of fever therapy. It should be used only in institutions. Diathermy and other physical methods of inducing fever are producing encouraging results in some institutions. The authors consider the use of sulphur the most practical method for the induction of fever in instances in which patients are not hospitalized. In patients that do not respond to treatment its continuance hastens death.

Pennsylvania Medical Journal, Harrisburg

38: 1-58 (Oct.) 1934

The Emergency Abdomen: Some Observations of Its Incidence in Persons Older Than Age Fifty. B. Lipshutz and C. S. Schafer, Philadelphia.—p. 5.
Glucose, with Especial Reference to Its Intravenous Administration. W. N. Long, York.—p. 9.
Prevention of Blindness During Middle and Advanced Age. A. Brav, Philadelphia.—p. 12.
The Abused Cervix. J. W. Kennedy, Philadelphia.—p. 14.
Etiology of Long Continued Fevers. B. I. Comroe, Philadelphia.—p. 16.
Echinococcus Cyst in Subcutaneous Tissues of Thigh. J. Speese and J. B. Mason, Philadelphia.—p. 18.
Treatment of Cancer of Breast. G. W. Grier, Pittsburgh.—p. 19.
Tularemia. H. L. Baer, Pittsburgh.—p. 24.
Autograft: Report of Case. F. Bushong and C. R. Elicker, Pottstown, Pa.—p. 28.
Cutaneous Photopigmentation and Cosmetics, with Especial Reference to Berlock Dermatitis. S. S. Greenbaum, Philadelphia.—p. 28.
Commissary-Fed Children in Eight Pennsylvania Communities: Report of Studies. Mary Riggs Noble, Harrisburg.—p. 31.

Public Health Reports, Washington, D. C.

49: 1169-1200 (Oct. 5) 1934

Experimental Studies of Natural Purification in Polluted Waters: No. IX. Nitrification in Sewage Mixtures. E. J. Theriault and P. D. McNamee.—p. 1169.
Actual Causes of Dermatitis Attributed to Socks. L. Schwartz.—p. 1176.

Southern Medical Journal, Birmingham, Ala.

27: 825-890 (Oct.) 1934

Consideration of Ureter in Serial Pyelograms. T. D. Moore, Memphis, Tenn.—p. 825.
New Method for Localization of Intra-Ocular Foreign Bodies with Outline of Their Management. M. E. Brown, New Orleans.—p. 833.
Pathology of Sickle Cell Anemia. L. W. Diggs and R. E. Ching, Memphis, Tenn.—p. 839.
*Patch Tests in Determination of Arsphenamine Sensitization. H. M. Robinson, Baltimore.—p. 845.
Thrombophlebitis Migrans: Report of Two Fatal Cases with Autopsies; One Also Showing Primary Carcinoma of Liver. N. S. Stern, Memphis, Tenn.—p. 849.
Diagnosis of Bacterial Allergy. G. T. Brown, Washington, D. C.—p. 856.
Trauma of Ureter. G. R. Livermore, Memphis, Tenn.—p. 861.
Practice in Peroral Endoscopy. T. R. Gaines, Anderson, S. C.—p. 863.
Health Centers in Rural Public Health Service. T. P. Haney Jr., McComb, Miss.—p. 865.
District Health Program in Rural Areas. I. B. Krause and W. F. Lunsford, Jefferson City, Mo.—p. 869.
Twenty Years of County Health Work in North Carolina. J. H. Hamilton and D. F. Milam, Raleigh, N. C.—p. 875.
New Instruments and Apparatus. S. R. Terhune, Birmingham, Ala.—p. 881.

Patch Tests in Arsphenamine Sensitization.—Robinson made patch tests with the arsphenamines in 163 persons, twenty-two of whom were nonsyphilitic controls, fifty-four were syphilitic patients, all of whom had received or were receiving arsphenamine treatment without reaction, eighteen were syphilitic patients who had developed a previous postarsphenamine jaundice, and sixty-nine who had had a previous postarsphenamine dermatitis. Tests were made with a 30 per cent solution of neoarsphenamine. Tests were also made with two other arsenical drugs now under investigation as to their therapeutic activity in syphilis. Pieces of old sterile linen about 2 cm. square were soaked in the various solutions and applied to the skin while wet, and each was covered with a piece of cellophane. This in turn was sealed at the margins with narrow strips of adhesive tape. Most of the tests were observed twenty-four hours later. All patients were instructed to report any reactions occurring before or after the regular observation time. Results were read as negative when the skin underlying the square of linen was normal or only slightly reddened; as moderately positive if there was erythema and swelling with an occasional papule, vesicle or both, and as strongly positive if there was an acute dermatitis with marked erythema, swelling and vesiculation. Of the twenty-two normal individuals used as controls, patch tests were negative in fourteen, moderately positive in five and strongly positive in three. Two of the three latter persons were tested a second time nine months later, with negative results in both. Of the fifty-four syphilitic patients, forty-three were completely negative, and eight showed moderately positive and three strongly positive reactions. The eighteen patients who had had a previous postarsphenamine jaundice without dermatitis were tested as a further control measure; in all the results were negative. In the sixty-nine patients who, during the course of arsphenamine therapy, had reacted with mild, moderate or severe exfoliative dermatitis, fifty-five were negative and fourteen gave a positive test, but only eleven of these were strongly positive. To four members of this group who reacted with strongly positive patch tests from 0.1 to 0.2 Gm. of neoarsphenamine was purposely administered intravenously. All developed a mild to moderate generalized dermatitis. From these observations the author concludes that in a patient who is known to be sensitive to arsphenamine a positive patch test with neoarsphenamine is confirmatory evidence of persistence of sensitization. Nevertheless the patch test is of no practical value for the demonstration of arsphenamine sensitization, since it is sometimes positive in normal persons and often negative in those known to be sensitive to arsphenamine. The continuance or interruption of arsphenamine therapy in a patient who has suffered from a postarsphenamine dermatitis cannot be predicated on the results of a patch test.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Ophthalmology, London

18: 497-560 (Sept.) 1934

*Irradiation Cataract. J. G. Milner.—p. 497.
Some Remarks on Pilocarpine. J. A. van Heuven.—p. 511.
Orbital Tumor: Report of Unusual Case. W. H. Gow.—p. 520.
Trachoma in Indians of Western Canada. J. J. Wall.—p. 524.
Ophthalmoplegia Associated with Bony Changes in Region of Sphenoidal Fissure. C. B. V. Tait.—p. 532.

Irradiation Cataract.—Milner states that exposure of the eyes to the effects of x-rays or radium is likely to result in the formation of cataract. This cataract has a typical appearance, its characteristics being the formation of vacuoles, cloudy areas and later a plaque. It also has a constant situation—the posterior cortex of the lens. There is always a latent period between exposure and cataract formation, and this can be said to be at least two years. It may be many years. One course of high voltage x-rays is sufficient to cause cataract. Too few cases of cataract due to radium have been seen to dogmatize, but it may be said (1) that beta rays, applied at short intervals for short periods, are effective in treatment and harmless to the lens and (2) that gamma radiation is likely to produce cataract. Protection of the eyes during treatment is impracticable, but efforts should be made to devise some method of screening the lens without jeopardizing the effect of the radiation.

British Journal of Urology, London

3: 207-312 (Sept.) 1934

Study of Craftsmanship of the Harris Technic for Prostatectomy. A. C. Morson and J. E. Semple.—p. 207.
The Isolated Specimen of Urine. F. Temple Grey.—p. 220.
Decompression of Bladder. H. Bailey.—p. 225.
*Observations on Carcinoma of Prostate. T. G. I. James and N. M. Matheson.—p. 235.
*Bacillus Alcaligenes-Faecalis as Organic Nucleus in Renal Calculus. G. Stuart, W. E. Thompson and K. S. Krikorian.—p. 243.

Carcinoma of Prostate.—James and Matheson discuss unusual manifestations encountered during an investigation of fifty cases of carcinoma of the prostate: 1. In a case of prostatic carcinoma with perineal involvement, in view of the previous history of periurethral abscess it is probable that an alteration in the tissue planes predisposed to this peculiar feature. General metastases apart from the involvement of the regional lymph nodes was absent. The diagnosis of the perineal node presented no difficulty. It is conceivable that a periurethral abscess might give rise to somewhat similar appearances. 2. In one case, six months after admission, several nodules appeared in the skin over the lower half of the abdomen and one nodule in the skin of the left side of the forehead. Histologic examination of sections of these nodules revealed the typical appearances of carcinoma of the prostate. Tissue predilection in all probability accounts for the rarity of skin involvement. The wide separation of the skin metastases in the case would indicate that they were of hemic origin. 3. Involvement of lymph nodes was illustrated by one case, in a man 61 years of age, who, on admission, was found to have involvement of each inguinal group. Urinary symptoms had been in existence for eighteen months. The left cervical group of glands became palpable three weeks after admission, and six weeks later those in the left axilla became affected. Within a month the glands in the right axilla were enlarged, and later the epitrochlear glands and those in the right supraclavicular region. In the meantime all the glands in the groin had become involved, and a secondary deposit in the left orbit had produced a marked proptosis. Necropsy revealed involvement of all internal groups of glands with diffuse carcinosis of the thoracic duct. 4. Bone metastasis was revealed in a man of 72 who was admitted for a fluctuating swelling the size of a small orange in the middle of the shaft of the right tibia. The radiating spicules in a roentgenogram, together with the evidence of bone destruction and the short history of two months, led to a diagnosis of osteogenic sarcoma. The prostate was small, indurated and nodular. Difficulty and occasional retention of urine with frequency had been present for a few weeks. Section revealed a hemorrhagic cystic tumor involving the medulla and cortex of the bone, and histologic examination presented the features of a prostatic cancer. This was confirmed at necropsy. No other bones were involved.

Alcaligenes Faecalis as Organic Nucleus in Renal Calculus.—Stuart and his associates report a case of renal calculus with Alcaligenes faecalis occurring in the urine and acting in the capacity of an organic nucleus. The organism was proved on intraperitoneal inoculation to be nonpathogenic to white mice and to guinea-pigs. It was inactive as a urea splitter and failed to support Rovsing's theory of stone formation. Autovaccine accelerated the healing of the operative wound, and the authors believe that it shortened the period of convalescence.

British Medical Journal, London

2: 539-578 (Sept. 22) 1934

Acute Osteomyelitis. J. Fraser.—p. 539.
Fungus Infection of Feet: Prophylaxis and Treatment. A. M. H. Gray.—p. 541.
Mucopurulent Tubotympanic Infections. T. R. Rodger.—p. 544.
Electrocoagulation of Prostate: Immediate and Late Results. H. Williams.—p. 549.
Residual Infection of Jaws. R. S. Taylor.—p. 552.

2: 579-618 (Sept. 29) 1934

Value of Antiseptics in Control of Bacterial Infections. C. H. Browning.—p. 579.
Use of Radium in Carcinoma of Bladder. A. J. D. Smith.—p. 584.
Allergic Factors in Rhinorrhea and Nasal Catarrh. T. Just.—p. 587.
Advantages of Intravenous (Evipan) Anesthesia in Ophthalmic Surgery. T. K. Lyle and F. G. Fenton.—p. 589.
*Chorionic Carcinoma: Report of Case Following Ruptured Tubal Gestation. R. C. Thomas.—p. 590.
Epidural Spinal Abscess: Case. J. Mintzman.—p. 593.

Chorionic Carcinoma.—Thomas reports a case in which a ruptured tubal pregnancy, removed by operation, was followed within a short time by malignant disease of the chorion. Three months after operation the growth had become palpable above the pelvic brim and was found at the second operation to have involved the whole of the right broad ligament, the right pole of the uterus, the bladder and the pouch of Douglas. The symptoms were pain of the lower part of the abdomen, cachexia and a tumor in the right iliac fossa. There was no uterine bleeding or discharge. Two massive doses of high voltage roentgen therapy resulted in definite retrogression of the tumor, considerable lessening of pain and improvement in the general condition of the patient. The author believes that there are three possible ways in which the case can be explained. In considering them he keeps in mind that he is dealing with a gestation sac that had ruptured into the peritoneal cavity. The possibilities are as follows: 1. During the rupture chorionic elements may have been sprayed over the surrounding parts, especially the right broad ligament and the pouch of Douglas. These underwent malignant degeneration later. 2. Chorionic carcinoma may have begun to develop before the actual rupture took place, with the result that malignant cells were directly spread over the broad ligament and the pouch of Douglas. 3. This type of growth extends by way of the veins. Although scattering of malignant cells may not have taken place, the veins of the broad ligament may nevertheless have been packed with syncytial and Langhans' cells spreading in all directions. These would have gone on proliferating after the removal of the ruptured ectopic gestation. An earlier stage of this condition would appear to have been present in Hartz's case.

Irish Journal of Medical Science, Dublin

No. **105:** 495-542 (Sept.) 1934

Differences in Effect of Various Impulses on Structure of Central Nervous System. C. U. A. Kappers.—p. 495.
Trend of Diphtheria Mortality in the Irish Free State. J. C. Saunders.—p. 520.
*Nutritional Anemia of Infancy: Comparison with Chronic Microcytic Anemia of Women During Child-Bearing Period. R. E. Steen.—p. 527.
What Is the Hyoid Apparatus? H. C. Wilson.—p. 535.

Nutritional Anemia of Infancy.—Steen compares the nutritional anemia of infancy with the chronic microcytic anemia of women during the child-bearing period. Nutritional anemia of infancy tends in certain infants to develop about the sixth or seventh month of postnatal life and may persist into the second year. One factor in its development is that milk, whether

human or cow's, is deficient in iron. As a result of this deficiency the store of iron is insufficient to carry the infant through the period until a mixed diet with foods containing iron are added. He demonstrates that etiologically the two anemias have fundamental points in common. An anemia due to a deficiency of iron (i. e., of the hypochromic type) may arise when the iron store in the body is depleted either by direct reduction, e. g. from hemorrhage and infection, or by insufficient ingestion of iron, either as a result of a deficiency in the diet or as a result of defective absorption from the intestine. If idiopathic hypochromic anemia is considered first on these lines, the first etiologic factor in its production must be depletion of the iron reserves from the constant repeated hemorrhages of menstruation and childbirth. No other view can explain why the disease is almost confined to the female sex, to the child-bearing period of that sex, and to the latter half of this period. The hemorrhagic factor in women, however, is liable to be overlooked because it is physiologic. The second etiologic factor must be the dietetic one: a deficiency of iron in the ingested food. The third etiologic factor may be achlorhydria. If the nutritional anemia of infancy is considered on similar lines, the first of the same three etiologic factors is not so obvious at first sight. Reduction of the iron reserves of the infant may occur in a number of ways, which are for the most part antenatal and hence result in a nondevelopment of the iron store of the fetus rather than in its depletion from hemorrhage, as in the case of idiopathic hypochromic anemia. The second etiologic factor is a deficiency of iron in the ingested food, since breast milk contains small amounts of iron and cow's milk still less. This factor will act most strongly in infants who have been kept too long on a milk diet exclusively. The third etiologic factor from the analogy with idiopathic hypochromic anemia might be ascribed to achlorhydria, but Parsons has shown that achlorhydria is not necessarily present in cases of nutritional anemia in infancy; it plays no part in its treatment, when iron alone is specific, and therefore is unlikely to play any important part in its etiology. This maintains the analogy with idiopathic hypochromic anemia, in which achlorhydria is probably of minor importance. The author suggests that, if this view of the synergic action in the production of idiopathic hypochromic anemia in adults and the nutritional anemia of infancy is accepted, and the deduction that fundamentally they are the same, it should help toward a clearer conception of the deficiency anemias as a whole. Furthermore, it would suggest that the present terminology of these anemias might be reviewed. Therefore the author submits the term idiopathic hypochromic anemia and suggests that it be reserved for a disease peculiar to women, just as the term nutritional anemia of infancy is reserved for a disease peculiar to infancy or early childhood, and that such diagnosis should be made only when all other possible organic causes have been excluded.

Journal of State Medicine, London

42: 497-558 (Sept.) 1934

Our Difficulties in the Conflict Against Tuberculosis. F. W. Burton-Fanning.—p. 497.
Arrangement of Institutions in Public Tuberculosis Schemes. S. V. Pearson.—p. 513.
Institutions for Tuberculous Children. D. A. Powell.—p. 519.
Present Position of Diphtheria Immunization. E. H. T. Nash.—p. 522.
Some Aspects of Vaccination of Cattle Against Tuberculosis. J. B. Buxton.—p. 527.
Noise and Public Health. D. McKenzie.—p. 542.
Public Health Service in Relation to Industry and the Industrial Worker. A. Massey.—p. 552.

Presse Médicale, Paris

42: 1441-1456 (Sept. 15) 1934

*Difficulty in Diagnosis of Certain Abnormal Forms of Diabetic Coma. M. Labbé and R. Boulin.—p. 1441.
Primary Tuberculosis of Cervix with Ulcerative Form Simulating Cancer. J. Veyrassat.—p. 1442.
Pulmonary Silicosis of Miner. R. Cassou and C. Blancardi.—p. 1443.

Diagnosis of Diabetic Coma.—The diagnosis of diabetic coma ordinarily involves no difficulty, but there are cases with some of the signs missing or with complicated phenomena that interfere with the diagnosis. Labbé and Boulin mention two cases that showed the typical symptoms and signs of diabetic coma except for negative diacetic acid reactions (Gerhardt's test) at the moment of coma. The test became positive after insulin treatment had been applied and finally disappeared after sufficient insulin had been administered. They report another case in which a young diabetic patient without previous evidence of renal disease fell suddenly into coma. The first impression was that this was a diabetic coma, but although the urine showed sugar, it contained no acetone or diacetic acid. Combined with the absence of air hunger and the presence of a myosis, the question of a uremic coma arose. The alkali reserve was extremely low and the blood urea confirmed the existence of uremia. Up to this point it was possible to say only that there was an acidotic coma, but whether of renal or diabetic origin was unknown. In spite of the administration of 920 units of insulin the patient remained in coma and this fact apparently confirmed the absence of diabetic coma.

42: 1481-1496 (Sept. 22) 1934

*Immediate Treatment of Postoperative Phlebitis by Procaine Hydrochloride Infiltration of Lumbar Sympathetic. R. Leriche and J. Kunlin.—p. 1481.
*Pathogenesis of So-Called Bright's Retinitis and Its Disappearance by Repeated Cerebrospinal Decompressions. A. Magitot and A. Dubois.—p. 1482.
Pathogenesis and Treatment of So-Called Menopausal Hemorrhages. C. Béclère.—p. 1485.
Ganglionic Connections of Lymphatics of Uterus. C. Lazaro.—p. 1487.
Surgical Treatment of Benign Inguinal Lymphogranulomatosis (Nicholas Favre Disease). G. Rousseau and C. Adamesteanu.—p. 1489.

Treatment of Phlebitis by Infiltration of Sympathetic.—Leriche and Kunlin report three cases of phlebitis treated by injection of procaine hydrochloride into the lumbar sympathetic. The needle is inserted 3 cm. from the spinal line and must pass under or over the transverse apophysis coming against the vertebral body. The needle is then drawn back 1 cm. and inclined at such an angle that the point loses contact with the bone. It is then reintroduced 2 cm. at a less oblique angle until a new bony contact is established. At this point, 10 cc. of a 1 per cent solution of procaine hydrochloride is injected. Usually this injection is painless. If the right location has been found, the patient soon states that there is a warmness of the corresponding leg. Objectively, this warmness may be corroborated. In the three cases of phlebitis thus treated there was a rapid disappearance of the painful sensations and there seemed to be a definite shortening of the duration of the phlebitis. It is necessary to repeat the injection daily as long as there is fever, pain or progressive edema.

Pathogenesis of Albuminuric Retinitis.—Magitot and Dubois discuss the known factors of the pathogenesis of albuminuric retinitis. These are grouped around two pathogenic theories, the toxic and the vascular. They believe it is probable that, when one decreases the volume of interstitial fluid by repeated removals of cerebrospinal fluid, the transudation of the capillaries is reduced at the same time as the reduction of the venous stasis. The authors conclude that the retinitis of generalized hypertension is not of renal origin. Generalized arterial hypertension itself is solely the result of a vascular disease affecting all the vessels. This hydrostatic element can of itself engender ocular lesions. The intracranial hypertension plays an important but not unique part. It seems necessary to postulate a combination of retinal arteriolar lesions, local arterial hypertension and intracranial hypertension in order to realize retinal lesions—edema, hemorrhages, exudates. Although these conclusions result from the observed facts, it is nevertheless necessary to reserve complete evaluation of the pathogenic mechanism.

Schweizerische medizinische Wochenschrift, Basel

64: 869-888 (Sept. 22) 1934

What is Nervousness? H. Binder.—p. 869.
Technic of Goiter Operations. O. Häuptli.—p. 875.
*Metastasizing Goiter with Solitary Metastasis in Retroperitoneal Lymph Node. J. Doepfner.—p. 878.
*Blastomycosis of Lungs and Pleura: Case. A. Spreng.—p. 879.
Evolution of the Conception of Gonorrhea. A. Franck.—p. 881.

Goiter with Solitary Metastasis in Retroperitoneal Lymph Node.—Doepfner relates observations that were made during the course of the necropsy held on a diabetic woman, aged 44, who died following mastoidectomy. He describes the condition of the thyroid, the brain, and a cystic nodule found in the retroperitoneal connective tissue. At first it was assumed

that the retroperitoneal nodule was a cystic lymphangioma, but histologic examination disclosed a struma nodosa colloides. Thus it was assumed that it was a metastasis of an adenoma of the thyroid. However, neither the macroscopic nor the microscopic examination of the thyroid disclosed a primary tumor, but the author suggests that the primary tumor may have been so small that it was overlooked. The localization of the solitary metastasis was unusual, for the adenomas of the thyroid usually metastasize by way of the blood stream. If metastatization does take place by way of the lymph vessels, the metastases are usually in the cervical, mediastinal and bronchial lymph nodes. The author believes that in the reported case the fact that the patient had had diabetes and her age were of some significance. He points out that an adenoma of the thyroid metastasizes rarely in younger persons but that the incidence of such metastases increases greatly during the fifth decade of life.

Blastomycosis of Lungs and Pleura.—Spreng relates a case of pneumomycosis in a woman, aged 53, who had nursed her daughter, who died of acute miliary tuberculosis. Soon after the death of the daughter the patient exhibited a number of symptoms indicative of tuberculosis and her disorder was at first diagnosed as such. However, the sputum, after standing for awhile, had a yeast odor, and in dextrose cultures the yeasts soon overgrew all other micro-organisms, and the case was now diagnosed as blastomycosis of the lung. The sputum contained a few streptococci but no tubercle bacilli. Later a pleural exudate developed. The chest was punctured and the punctate contained yeasts, and thus the diagnosis of blastomycosis of the lungs and pleura was corroborated. Since medication with potassium iodide and roentgenotherapy of the lungs did not produce the desired therapeutic effects, the daily administration of increasing doses of quinine was instituted. Later an autovaccine was prepared and the patient was given intracutaneous injections of from 0.2 to 0.3 cc. of this vaccine at intervals of from two to three days. Under the influence of this treatment the patient recovered. A source of infection could not be determined. The pathogenic agent belonged to the genus of Saccharomyces, but exact identification did not succeed. The author points out that the pathogenic yeasts are generally found among the wild yeasts, of which there exist approximately 500 different types. Buschke's classification of pathogenic yeasts differentiates three groups: (1) true yeasts (Saccharomyces) the originators of the European blastomycoses, (2) yeastlike micro-organisms, the originators of American blastomycoses, and (3) Endomyces, the causes of thrush. In discussing the port of entry the author points out that in a large percentage of cases the primary disease is in the lungs. The presence of diabetes favors development, and in some diseases the yeasts cause superinfections.

Riforma Medica, Naples

50: 1297-1332 (Aug. 25) 1934

*First Clinical Observations on Ascoli's Serum Reactions in Neoplasms. C. Vercesi and F. Guercio.—p. 1299.
Isolated Tuberculosis of Cranium. L. Docimo.—p. 1303.
*New Reaction for Diagnosis of Tuberculosis. M. Lenzi.—p. 1306.
Pleuropericardial Artery Originating from Common Right Carotid Artery of Neck: Accessory Tracheal Thyroid. F. Bellelli.—p. 1312.

Ascoli's Serum Reactions in Neoplasms.—Vercesi and Guercio studied the effects of three tumor serum tests proposed by Ascoli in ninety-seven cases presenting benign and malignant tumors and normal and pathologic pregnancies: 1. In the first test, 1 cc. of clear serum taken from a fasting patient is placed in a tube and to this is added 1 mg. of bilirubin. The mixture is left to stand for an hour and then vigorously shaken. It is centifugated for fifteen minutes at 300 revolutions per minute. The serum turns yellow, while in the bottom of the tube there remains some bilirubin in excess; the supernatant fluid is poured into another tube containing 1 cc. of ether and the mixture is shaken twenty times and left standing for two hours. If the reaction is positive, the ether turns yellow and there is jellification of the underlying serum (++ reaction); sometimes the ether becomes yellowish and the underlying serum is still fluid (+ reaction). 2. For the acidimetric determination of the ethereal extract of serum and ricinoleic acid, 1 cc. of serum is put in a tube in which 0.2 cc. of an alcoholic solution of ricinoleic acid in the proportion of two per thousand has been previously allowed to evaporate and it is left standing for a few hours. The serum dried at room temperature on filter paper is extracted in sulphuric ether for twenty-four hours; the ether is decanted and evaporated in a hot water bath. The residue is dissolved in 10 cc. of 99 degree alcohol and titrated with hundredth normal solution of sodium hydroxide. 3. For the glycolytic test in vitro, the erythrocytes are washed in a physiologic solution two or three times and 0.4 cc. of erythrocytes is placed in a tube. To this is added 1.6 cc. of Ringer's dextrose solution; after three or four hours of contact, the mixture is centrifugated and the amount of lactic acid in 1 cc. of Ringer's solution is estimated. In these three tests applied by the authors, 80 per cent of the serums derived from malignant tumors gave positive reactions; the bilirubin test by itself was positive in 90 per cent. In serums derived from benign tumors, especially from fibromyomas, the bilirubin test was positive in 50 per cent, while the acidimetric and glycolytic tests were constantly negative. Cases of pregnancy always gave a negative reaction to the acidimetric and glycolytic tests. Of twenty cases, there was only one positive reaction to the bilirubin test, in a case presenting early pregnancy complicated by compensated cardiopathy.

Reaction for Diagnosis of Tuberculosis.—Lenzi advocates the following technic for the diagnosis of pulmonary tuberculosis: Four tenths cubic centimeter of a freshly prepared solution of 3.8 per cent sodium citrate in distilled water is placed in a syringe. With the same syringe, 1.6 cc. of blood is aspirated from the median vein of the arm. The mixture in the syringe is shaken and twenty drops of it is placed in one watch glass and twenty drops in another. One drop of a 1 : 10,000 sterilized solution of tuberculin is added to the second glass. The contents of each glass are poured in separate tubes, which are placed in a stand. The stand is put in an incubator kept at body temperature, and the millimetric readings of the erythrocytic sedimentation speed are made every ten minutes. The period of observation may be from less than one to two hours. The first tube acts as a control for the second, in which the reaction takes place. In twenty healthy persons the reaction was positive in two, doubtful in one and negative in seventeen. Of thirty-six nontuberculous patients having such diseases as tumors, arthropathies, malaria, exophthalmic goiter and other acute infections, three showed positive, two doubtful and thirty-one negative reactions. Of fifty-eight patients having pulmonary tuberculosis in various stages, fifty gave positive and six negative reactions. The author concludes that his reaction is of great value for the diagnosis of pulmonary tuberculosis, that it may indicate the degree of organic reactivity and of defense, and that in the future it may prove to be an aid to the serologic diagnosis of diseases other than tuberculosis.

Klinische Wochenschrift, Berlin

13: 1297-1344 (Sept. 15) 1934. Partial Index

Differential Diagnosis Between Malignant and Benign Organic Gastric Diseases. H. Dressen.—p. 1300.
Osteopoikilosis of Cranium. H. Erbsen.—p. 1306.
*Paralysis After Repeated Serum Injections. E. Hahn.—p. 1309.
Functional Tests of Cardiopulmonary System. E. Krauss and A. Pätzold.—p. 1310.
Two Fatalities in Thoracocautery. C. Kröber.—p. 1312.
Foreign Bodies in Gastro-Intestinal Tract. P. N. Lauxen.—p. 1314.
Significance of Exogenous Factors in Pathogenesis of Schizophrenia. R. Leppien.—p. 1314.
*Replacement of External Malleolus by Free Tibial Transplant According to Lexer. W. Noetzel.—p. 1318.
Spontaneous Pneumothorax in Early Childhood as Complication of Pneumonia and Its Accompanying Disorders. L. Schall.—p. 1324.
Significance of Takata Reaction for Diagnosis of Liver Diseases in Its Relation to Galactose and Bilirubin Tolerance Test. L. Schindel and E. Barth.—p. 1329.

Paralysis After Repeated Serum Injection.—According to Hahn, paralysis has been observed after a single injection of serum, but repeated injections, particularly of prophylactic tetanus antitoxin, are the most frequent cause of anaphylactic reactions. He gives the history of a man, aged 38, who, in a motorcycle accident, sustained a wound of the supraorbital rim. He stated that he had not received a serum injection before. He was given an injection of tetanus antitoxin. During the following night he suddenly felt a burning pain under both scapulas, his chest felt constricted, and he had dyspnea, vomited and developed a wheal exanthem over the entire body. After medication with calcium, the manifestations disappeared within

the next two days, but six days later he again had burning pains under both scapulas and in the right supraclavicular cavity and he complained of nausea and dyspnea. On the following day he lost consciousness, the wheal exanthem reappeared, he was no longer capable of lifting his arms sideways, and the movement of the head toward the right side was difficult. Examination at a later date revealed hyperesthesia of the right supraclavicular fossa, impairment of the abduction and of the lateral elevation of the right arm, protrusion of the right scapula, and atrophy of the deltoid muscles. Roentgenoscopy revealed elevation of the diaphragm on the right side. The patient had a paralysis of the anterior serratus, of the deltoid muscle and of the right half of the diaphragm. The related nerves, the long thoracic, the axillary and phrenic nerves, originate in the cervical and brachial plexus. The author maintains that this is the most frequent localization of the paralysis following serum injection. The paralysis is usually dissociated in that not all muscles innervated by the same root are equally involved, and the sensory fibers are likewise hardly ever involved. A new careful anamnesis revealed that the patient had received an injection of tetanus antitoxin while wounded during the war. Four years after that he was in a mine accident and was again given a tetanus antitoxin injection. At this time he developed painfulness in the scapulas and impairment of the movement of the arms, which persisted for several months. The attack of paralysis that has been described developed thirteen years after the mine accident. Thus it was the second and third injections of tetanus antitoxin that caused a polyneuritic paralysis.

Replacement of External Malleolus by Free Tibial Transplant.—Noetzel points out that, as a rule, the free tibial transplant is used for the bridging of bone defects, in the form of a rivet or a splint, so that both ends of the transplant are again connected with bone tissue. Rarely does the transplant serve as a substitute for the termination of a bone. The author describes two operations in which the free tibial transplant was used in this manner. In the first case the malleolus and about 4 cm. of the fibula had to be removed on account of a myxochondroma. This piece of bone was replaced by a free tibial transplant, 9 cm. long and 3 cm. wide. The tip of the transplant was forced into the medullary cavity of the fibula in such a manner that the periosteal surface was on the outside. Thus the transplant was securely fastened and the tendons of the peroneus were secured in the proper position behind the transplant by means of catgut threads. Following suture of the wounds, the extremity was put into a plaster-of-paris cast, which was left on for four weeks. Roentgenoscopy after six months revealed that the bone connection was tight and that the transplant had become considerably thicker. The function was satisfactory. The anterior deviation of the transplant caused no disturbances. The case is interesting from the biologic point of view because of the preservation and the independent growth of a transplanted piece of bone, which is connected with the normal bone only at one point and which at the periosteal surface is covered only with skin. The author stresses that whenever possible he takes the transplant from the same leg on which the operation is performed. In the second case the second metacarpal of the right hand had to be removed on account of an enchondroma. It was replaced by a free transplant from the right tibia, 5 cm. long and 1 cm. wide. Here again the functional results were satisfactory.

13: 1345-1376 (Sept. 22) 1934. Partial Index

Rôle of Stomach in Formation of Blood. K. Hitzenberger.—p. 1345.
*Iodine and Cholesterol Content of Blood in Its Relation to Essential Hypertension. M. Bürger and W. Möbius.—p. 1349.
Measurement of Temperature in Cardiac Chambers and in Central Vessels. D. Laszlo and M. Wachstein.—p. 1352.
*Influence of Vitamin C (Cevitamic Acid) on Dopa Reaction. T. Grüneberg and H. Schade.—p. 1353.
Significance of Vitamin C in Pigment Metabolism. W. von Drigalski.—p. 1354.
*Significance of Takata Reaction for Diagnosis of Liver Diseases in Its Relation to Galactose and Bilirubin Tolerance Test. L. Schindel and E. Barth.—p. 1355.

Iodine and Cholesterol Content of Blood and Its Relation to Essential Hypertension.—Bürger and Möbius found that the age of a person seems to have an influence on the iodine content of the blood. In women it shows a certain increase after the fifth decade of life. Patients with hypertension as a rule have a greater quantity of iodine in the blood. Increase in the basal metabolism and hyperiodemia, together with the clinical aspects of hypertension, indicate a causal connection between increased thyroid activity and essential hypertension (disturbance in the correlation of incretory organs). The cholesterol content of the blood of patients with hypertension is not increased. The values detected by the authors were generally within normal limits, and they think that the occasional appearance of high cholesterol values in patients with hypertension is of no causal significance.

Influence of Vitamin C on Dopa Reaction.—Grüneberg and Schade call attention to Schroeder's report on the inhibition of the dopa reaction by vitamin C, *Klinische Wochenschrift* (**13**:553 [April 14] 1934; abstr. THE JOURNAL, June 9, 1934, p. 1992) and then describe their own studies. Tests on tissue sections revealed that vitamin C (cevitamin acid, or ascorbic acid) inhibits the dopa reaction. They assumed, however, that the cevitamic acid does not attack the dopa oxydase in the tissue sections but merely causes chemical transformations in the dioxyphenylalanine and thus makes it unsuitable for one reaction. They were able to prove this in another series of tests, in which tissue sections were exposed to the influence of vitamin C for thirty minutes, then the vitamin C was completely removed by repeated washings, and after that the sections were exposed to dopa solution in the same manner as several control sections. The reactions were the same; that is, there was no inhibition of the dopamelanin formation. They admit that test tube experiments can be employed for the clarification of biologic problems only to a limited extent, but they nevertheless believe that their experiments are not without value in the investigation of the relations between vitamin C and pigment formation, and they think that their observations justify the conclusion that, if vitamin C influences pathologic pigmentations of the skin, it is not the dopa-oxydase that is the point of attack.

Takata Reaction in Liver Diseases.—Schindel and Barth performed the Takata test in 687 cases. Of this number, fifty-nine gave a positive, twelve a weakly positive and 616 a negative reaction. They believe that the positive Takata reaction is characteristic for cirrhosis of the liver, for it was positive in 83.8 per cent of the cases. When the liver was impaired as the result of a circulatory disturbance, the Takata reaction was positive in 18 per cent of the cases. A similar percentage of positivity of the Takata reaction was found in the disorders that are grouped under the heading of hepatopathies. In cholecystopathies and in cholangiopathies the percentage of positivity was still smaller. Patients with tumor metastases in the liver had a positive reaction rather frequently. In other diseases the Takata reaction is only occasionally positive, and, if it is, an involvement of the liver may be assumed. The authors show that the outcome of the Takata reaction is caused neither by a shifting in the albumin-globulin quotient nor by a change in the total albumin content of the serum and that there is no parallelism to the sedimentation speed of the erythrocytes. The positive Takata reaction indicates a disappearance of the hepatic parenchyma, and it is thus an indication of morphologic changes. It has not been determined what degree of parenchymal damage is necessary to make the reaction positive. It is likewise still unknown in what manner the liver effects a change in the flocculation behavior of the serum. The authors are inclined to believe that the appearance of the lower forms of the fatty acids plays an important part. The outcome of the Takata test gives no information about the functional condition of the remaining parenchyma, and for this reason the tolerance tests of the liver cannot be dispensed with. When the tolerance tests are carried out it is necessary to give attention to the previous diet, for the authors believe that disregard of this factor is the cause of many divergences in the estimation of the tolerance tests. There is rarely a parallelism either between the Takata reaction and the tolerance tests or between the different tolerance tests. The authors' own experiences with the galactose and bilirubin tolerance tests did not make them less pessimistic about the value of the tolerance tests, but they gained the impression that at least the Takata reaction presents a valuable addition to the diagnostic armamentarium, although only a small proportion of liver diseases can be definitely detected with it.

Wiener klinische Wochenschrift, Vienna

47: 1081-1104 (Sept. 7) 1934. Partial Index

So-Called Precancerosis. C. Sternberg.—p. 1081.
Physiochemical Methods in Examinations of Medicines. L. Fuchs.—p. 1083.
Rare Cerebellar Disease Presenting Aspects of Cerebral Tumor. B. Kecht.—p. 1087.
Ventriculography and Encephalography in Diagnosis and Therapy of Nervous Disturbances. H. Urban.—p. 1090.
Tuberculous "Early Exanthem." D. von Móritz.—p. 1091.
Clinical Aspects and Diagnosis of Thrombosis of Coronary Arteries. E. Friedländer.—p. 1093.
Obstacles to Delivery and Their Treatment. L. Kraul.—p. 1096.

Value of Ventriculography and Encephalography.—Urban applies the term ventriculography to that form of roentgenography of the brain in which the air is introduced directly into the ventricles, and he designates as encephalography that form in which the air is introduced by suboccipital or lumbar injection. He concludes that they are the most valuable of the physical aids for the diagnosis of cerebral tumors. Since the filling of the ventricles is of vital importance for a correct diagnosis, ventriculography is sometimes effective in cases in which encephalography fails. The introduction of air has therapeutic value, particularly in genuine and traumatic epilepsy. The author asserts that improvement or cure is effected in about 55 per cent of the cases of genuine and traumatic epilepsy in which air inflation is combined with medication by means of bromine derivatives or phenobarbital.

47: 1105-1128 (Sept. 14) 1934

Radical and Palliative Surgery in Gastric and Intestinal Diseases. J. Schnitzler.—p. 1105.
*Intermittent Dilatation of Abdominal Aorta. F. Högler.—p. 1111.
Adhesive Pleurisy. A. V. Frisch and M. Vita.—p. 1115.
*Phrenic Pressure Point as Differential Diagnostic Sign in Diseases of Gallbladder. R. Bayer.—p. 1117.
Infection Index of Patients with Cancer. P. Engel.—p. 1118.
Poisoning with Potassium Ferrocyanide with Impairment of Kidney. L. Popper.—p. 1119.
*Local Application of Diathermy in Essential Hypertension. Trolow, Malkowa-Riabowa and Altmann-Pargmanik.—p. 1121.

Intermittent Dilatation of Abdominal Aorta.—Högler points out that intermittent dilatation of the abdominal aorta is often overlooked or mistaken for other abdominal disorders, such as gastric or duodenal ulcer, cholelithiasis, chronic appendicitis or various vascular disturbances (atherosclerosis, aneurysm, or Pal's abdominal vascular crisis). Rosenbach was the first to give a detailed description of the disorder (1894), but later several other authors described it. Rosenbach gave the following description of the clinical aspects: Without apparent reason, and occasionally in a state of complete well being, a brisk pulsation appears in the epigastric region, accompanied by more or less severe pains. The patients state that it feels as if they had a second heart in the abdomen, the pulsation of which causes a burning and piercing pain. This pain frequently radiates to the back and rarely also to the thighs. In addition to this there develop colic-like gastro-intestinal disorders accompanied by heartburn, nausea and urge to defecation and occasionally constipation and flatulence. Frequently the patients complain of severe hunger, palpitation of the heart and profuse sweating. The attacks of pain may last several hours and they usually appear at intervals of several weeks. Palpation reveals a whirring sound over the abdominal aorta. The vessel is noticeably dilated and usually sensitive to pressure. On auscultation over the pulsating abdominal aorta the examiner hears a long drawn out blowing sound, which is loudest to the left of the median line between the edge of the liver and the umbilicus. As the pulsation and the pains subside, the objective manifestations disappear likewise. It is assumed that these peculiar symptoms are the result of the dilatation of the abdominal aorta and the dragging on the adjoining organs, particularly the ganglions and the nervous plexus. Moreover, the intense pulsations influence also the adjoining sections of the gastro-intestinal tract. The underlying cause is presumably a vagus neurosis, which by reflex action reduces the tonus of the abdominal aorta and is followed by a dilatation of the vessel. The author presents the clinical histories of several patients with intermittent dilatation of the abdominal aorta. Periods of latency alternate with attacks. During the latent periods the author was able to produce attacks by means of the subcutaneous injection of from 0.5 to 1 mg. of epinephrine. Tests on normal persons revealed that in these the symptoms of dilatation of the abdominal aorta remained absent following epinephrine injection. Thus epinephrine injection may prove valuable in differentiating dilatation of the abdominal aorta from other abdominal disorders.

Phrenic Pressure Point in Diseases of Gallbladder.—Bayer calls attention to a sign that, although described before, has been given little attention. The sign is helpful in the differentiation of disorders of the gallbladder and liver from ulcers of the stomach and the duodenum, the latter frequently presenting symptoms similar to those of hepatobiliary disorders. The sensitive point on the phrenic nerve is between the sternocleidomastoid muscle and the anterior scalenus on the right side of the neck. If disease of the diaphragm and of the thoracic cavity can be excluded, the painfulness of that point to pressure indicates disease of the gallbladder; but absence of sensitivity does not necessarily prove the absence of gallbladder disease.

Diathermy in Hypertension.—Trolow and his associates are of the opinion that disturbances in the endocrine-sympathetic systems with subsequent regulatory disturbances of the entire vascular system and with vascular spasms of the abdominal organs play an important part in the pathogenesis of essential hypertension. They decided to apply diathermy to the celiac plexus and to the suprarenals. The position of the kidneys was determined and marked on the skin. Two electrodes, each 150 sq. cm. in surface, were fixed in such a manner that one half of each electrode was applied over the marked region and the other half reached beyond it into the region of the suprarenals. In addition to these two electrodes a third, of 300 sq. cm., was applied in the center of the epigastric region, immediately below the xiphoid process. In some cases this third electrode was replaced by two, each of them having half the surface and being placed over the lateral epigastric regions, below the costal arch. The treatments were given with a current strength of from 0.5 to 2 amperes. The patients were lying down when the diathermy was applied. The treatments lasted from five to ten minutes, and they were given daily or every second day. The total number was from fifteen to thirty, depending on the results. After each treatment the patients had to rest for about thirty minutes. The blood pressure, the pulse, the respiration and the general condition were determined before, during and after each treatment. Of the twenty-five patients treated in this manner four were not influenced, one showed a slight increase in pressure, but the other showed a reduction of the maximal pressure. The minimal pressure was reduced in fifteen cases. The reduction of the pressure that had been obtained by means of the diathermy persisted in some instances for from eight to ten months, while in others a relapse occurred after about two months. In two patients the blood pressure was higher three or four months after the treatment than it had been before. The frequency of pulsation and respiration remained generally about the same. The authors conclude that in the majority of cases the results were favorable and think that the treatment deserves further attention.

Zentralblatt für Gynäkologie, Leipzig

58: 2225-2288 (Sept. 22) 1934

Multiple Urethroceles in Women. A. Baidin.—p. 2225.
Clinical Aspects of Emphysematous Cystitis. T. Antoine.—p. 2230.
Operation for Vesicovaginal Fistulas and for Urethrocele. W. Stoeckel.—p. 2235.
Vesicovaginal Fistulas. G. Frommolt and A. Stamatiades.—p. 2242.
Implantation or Anastomosis of Ureter. B. S. ten Berge.—p. 2251.
*"Pyelitis Granularis" as Cause of Severe Hemorrhage from Renal Pelvis. B. Ottow and J. Pahl.—p. 2256.
*Interruption of Pregnancy on Account of Pregnancy Pyelitis, Really on Account of Pyelonephritis. F. von Mikulicz-Radecki.—p. 2264.

"Pyelitis Granularis" as Cause of Hemorrhage from Renal Pelvis.—Ottow and Pahl say that although granular pyelitis has been known for a long time, the number of cases that have been observed is small. Aside from cases accidentally discovered at necropsy, granular pyelitis is usually detected in the course of renal surgery for severe renal hemorrhages. They give the history of a woman, aged 34, who had had hematuria of changing severity for ten weeks. Cystoscopy revealed that the bladder and ureters were free from pathologic changes. Pyelography showed certain abnormalities that made

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the existence of a neoplasm possible, and surgery was resorted to. The kidneys were practically normal, but the wall of the renal pelvis was thickened and there were several ridge-like protrusions. On palpation the mucous membrane was rough, and examination through the magnifying glass disclosed that it was stippled. In the connective tissue there were bloody streaks and spots, some of them being overfilled vessels and some being extravasations. Microscopic inspection of the capsule revealed funnel-like inflammatory foci, which were old interstitial inflammations. The uriniparous and the vascular apparatus of the kidney was largely intact. The severest changes were in the connective tissue of the renal pelvis. Underneath the epithelial layers of the mucous membrane there were leukocytic and lymphocytic infiltrations and lymph follicles. In some places the epithelial layers were lifted up, particularly above the follicles, but also occasionally above the infiltrations. The chronic inflammatory process led to ruptures of the vessels in the region of the renal pelvis and perhaps also in the kidney and thus led to prolonged hematuria, which in turn resulted in anemia. The authors think that decapsulation of the kidney is not likely to arrest hemorrhages caused by granular pyelitis and that extirpation will generally become necessary.

Interruption of Pregnancy on Account of Pyelitis.—In cases of pyelitis of pregnancy in which the renal parenchyma becomes involved, that is, in pyelonephritis, von Mikulicz-Radecki considers interruption of the pregnancy advisable. On the basis of statistics, these cases amount to from 1 to 3 per cent of the total material. He thinks that in pyelitis limited to the renal pelvis conservative measures usually produce improvement and cure. The danger begins when the renal parenchyma becomes involved, particularly when the involvement is bilateral, when the accumulation of pus in the renal pelvis has become so great that it acts like an abscess and when the upper portion of the ureter has become involved to such an extent that as a result of the fixation of the ureteral bent the discharge of urine and pus is obstructed. The author thinks that the danger is especially great for women with an infantile or asthenic habitus. He recommends a trial with conservative measures, particularly ureteral catheterization, irrigation of the renal pelvis and continued drainage of the ureter. However, if these measures do not improve the condition soon, the pregnancy should be interrupted. Interruption is indicated (1) when fever and pains persist for longer periods and when chills and accelerated pulsation become manifest, (2) if toxic and septic symptoms develop (icterus, vomiting and loss of weight), (3) if the conservative measures fail, and (4) if the albumin content of the urine exceeds the content in leukocytes and when casts are present. In discussing the technic of the interruption of pregnancy he states that some authors have advised against the vaginal route because of the danger of infection by colon bacilli. He believes that this danger has been exaggerated. He advises the vaginal method as long as the fetus is not yet viable and recommends prompt evacuation of the uterus by anterior hysterotomy, so that there is no time for the micro-organisms to travel upward. However, if the fetus is already viable, the author considers delivery by abdominal section the best method.

Acta Chirurgica Scandinavica, Stockholm

75: 273-467 (Sept. 26) 1934

*Clinical Contribution to Knowledge of Osteochondritis Dissecans. J. Hellström and K. Östling.—p. 273.
Total Gastrectomy for Cancer with After-Examinations of Absorptive Capacity of Intestine. P. Bull and J. Stang.—p. 319.
Acute Tuberculous Epididymitis and Epididymo-Orchitis. T. Sjöstrand.—p. 329.
*Acute Pancreatitis. O. Mikkelsen.—p. 373.
Healing of Fractures of Neck of Femur After Osteosynthesis with Stainless Steel Nail. I. Palmer.—p. 416.
Endothelioma of Stomach: Casuistic Report. L. Dahlgren.—p. 451.

Osteochondritis Dissecans.—Hellström and Östling report seventy-three cases of osteochondritis dissecans, of which forty-six were of the knee joint, twenty-four of the capitulum humeri, and one each of the talus, the second metatarsal head and the second metacarpal head. The last mentioned localization has not been described in the literature. Bilateral disturbances were present four times in the knee joint and twice in the elbow joint. Patients with osteochondritis dissecans of the capitulum humeri, the patella and the lateral femoral condyle were, as a rule, of younger age than those having osteochondritis dissecans of the internal femoral condyle. Most patients belonged to the working class. The symptomatology has not differed from the ordinary one. It is noteworthy that locking may occur without free bodies being present. The diagnosis was confirmed by roentgen examination. This may show typical osteochondritis dissecans in which no such condition can be discovered by arthrotomy. The differential diagnosis is concerned with specific and septic osteochondritis, spontaneous traumatic separations, chondromalacia and so-called aseptic bone necrosis. In considering the course of the disease, one has to pay attention to the origin and subsequent development of the osteochondritic focus, the loose bodies and secondary articular changes, especially arthritis deformans. The authors show that osteochondritis dissecans may arise as a direct sequel of a single trauma and they are on the whole advocates of a traumatic etiology without, however, underrating the constitutional and hereditary factors. Osteochondritis dissecans may conceivably be concerned with two forms, the purely traumatic and the spontaneous form, the true cause of which is still unknown. As to the frequency of osteochondritis dissecans of the elbow joint, the authors have examined the roentgenograms of 1,500 elbows and roentgenologically both elbow joints of 206 male subjects who did not present any symptoms. Osteochondritis dissecans of the elbow joint has occurred much less frequently in their material from Stockholm than in Nielsen's material drawn from the rural districts of Jutland.

Acute Pancreatitis.—Mikkelsen deals with severe acute pancreatitis. A review of the literature shows that its treatment still remains almost exclusively operative and that the results of such treatment still show an average mortality of 50 per cent. The operative treatment involves an attack either on the pancreas (incision into the capsule and drainage) or on the bile ducts. The author points out that there is no anatomic basis for an operative attack on the pancreas. The pancreas has no true capsule in the anatomic sense of the term. The structure that is divided on incision into the pancreas in the peritoneum covering the organ, and an incision through this peritoneal covering cannot relieve its secretory tension. The pancreas is made up of many small lobules that are separated by thin septums of connective tissue each enclosing an individual lobule. In order to relieve the pressure tension in the pancreas it would be necessary to divide the thin layer of connective tissue covering each lobule and that would not be feasible. Besides, these interlobular connective tissue septums are intimately connected with the glandular tissue, which is always affected at the same time. An operation of this kind is thus apt to cause an increase rather than a reduction in the necrosis and intoxication; besides, it implies a not inconsiderable risk of hemorrhage and fistula formation. The theoretical basis for an operation on the bile ducts is more logical, but the systematic employment of such operative measures in recent years has not lowered the case mortality decidedly, no doubt because these patients are in such a poor condition that they are not able to stand any operative treatment whatever. Recently a few surgeons have turned to a more conservative treatment, some of them postponing the operation till the "shock stage" is passed, others waiting until all acute symptoms have subsided, after which an operation is performed for gallstones when such are found to constitute the underlying cause of the acute pancreatitis. Operation is also performed, of course, if the process goes on to abscess or cyst formation. During the last eight years they have treated conservatively thirty-nine patients with severe acute disorders of the pancreas. Twenty of these were extremely ill, their general condition being very poor (shock). Three of the twenty patients died, and the remaining nineteen were gravely ill but not actually shocked. The diastase value was most often 3,000, 4,000, 6,000 and 12,000. In but two cases was the diastase value under 2,000. Operation was performed only in cases in which gallstones were ascertained and not until from one to three weeks after the acute symptoms had subsided. The treatment adopted by the authors consisted of a supply of fluid by mouth, skin and vein, and the use of stimulants and peristaltics. The mortality with this conservative treatment was 7.5 per cent.